

Zoological Record

Vol. 87, Sect. 15, 1950

PISCES

COMPILED BY

G. PALMER (Recent) and
E. I. WHITE, D.Sc. (Fossil)

PRINTED FOR THE ZOOLOGICAL SOCIETY OF LONDON
SOLD AT THEIR HOUSE IN REGENT'S PARK
LONDON, N.W.8.

PRICE SEVEN SHILLINGS

August, 1952

SEPARATE SECTIONS OF THE ZOOLOGICAL RECORD

In addition to the complete bound volume, the separate Sections may be obtained singly, bound in printed paper covers.

The following are the Sections and their prices, viz. :—

							<i>s.</i>	<i>d.</i>
1. Comprehensive Zoology	...	...	...	...	...	...	2	6
2. Protozoa	...	...	...	...	...	...	7	6
3. Porifera	...	...	...	...	...	...	2	0
4. Coelenterata	...	...	...	...	...	...	4	0
5. Echinoderma	...	...	...	...	...	...	2	6
6. Vermes	...	...	...	...	...	...	10	0
7. Brachiopoda	...	...	...	...	...	...	3	0
8. Bryozoa	...	...	...	...	...	...	2	0
9. Mollusca	...	...	...	...	...	...	10	0
10. Crustacea	...	...	...	...	...	...	5	0
11. Trilobita	...	...	...	...	...	...	3	0
12. Arachnida	...	...	...	...	...	...	7	6
*13. Insecta	...	...	...	...	...	...	30	0
14. Protochordata	...	...	...	...	...	...	2	0
15. Pisces	...	...	...	...	...	...	7	0
16. Amphibia and Reptilia	...	...	...	...	...	...	7	6
17. Aves	...	...	...	...	...	...	7	6
18. Mammalia	...	...	...	...	...	...	7	6
19. List of New Genera and Subgenera	...	...	...	...	...	...	3	0

* Obtainable only from the Commonwealth Institute of Entomology, 41, Queen's Gate, London, S.W.7.

15. PISCES

COMPILED BY

G. PALMER (Recent) and
E. I. WHITE, D.Sc. (Fossil)

CONTENTS

	PAGE
I. TITLES	1
II. SUBJECT INDEX	48
III. SYSTEMATIC INDEX	62

I.—TITLES

1.—Bull. zool. nomencl., Lond., 4 1950 pp. 337-338; 426-428; 433-435; 536-539.

2.—California co-operative sardine research program. Progress Report 1950. Calif. Dept. Nat. Resour. Marine Res. Committee 1950 pp. 1-54 figs. 1-37.

Aasen, O. *see* Fridriksson, A.

3.—Abe, T. Notes on some of the commoner puffers from East China Sea and adjoining waters, with description of *Sphoeroides vermicularis radiatus* Abe. Contr. Central Fish. Stat. Japan No. 8 1948 pp. 227-233 [*see also* Vol. 86 1949. Title No. 5.]

4.—Abe, T. Taxonomic studies on the puffers (Tetraodontidae, Teleostei) from Japan and adjacent regions III. Variation of anal fin. IV. Variation of caudal fin. Contr. Central Fish. Stat. Japan Nos. 51-52 1948 pp. 123-144 19-27 figs. tables. [*see also* Vol. 86 1949. Title No. 7.]

5.—Abe, T. New, rare or uncommon fishes from Japanese waters. I. *Liparis franzi*, new name. Jap. J. Ichthyol. 1 1950 pp. 135-139 2 text-figs.

6.—Abegg, R. Some effects of inorganic salts on the blood specific gravity and tissue fluids of the bluegill *Lepomis macrochirus* Raf. Physiol. zool., Chicago 23 1950 pp. 124-134 4 text-figs.

7.—Abella de Lopez, C. La moderna exhibicion de peces en los museos. 1st Congr. nac. Pesq. Mar d. Plata 2 1950 pp. 271-284, 1 pl., 20 figs.

8.—Achmerov, A. Zur Ökologie von *Livoneca amurensis*. Zool. Anz. 133 1941 pp. 42-45, 4 figs.

9.—Affleck, R. J. Some points in the function, development and evolution of the tail in fishes. Proc. zool. Soc. Lond. 120 1950 pp. 349-368 10 figs.

10.—Ahrens, W. Mikroskopische Untersuchung der Otolithen (Ohrsteine) des Fischlabrynth am nach Spalteholz aufgestellten. Mikrokosmos, Stuttgart 39 1950 pp. 85-92 6 text-figs.

11.—Airan, J. W. Studies in Kolhapur fresh-water fishes. Pt. I. Water-extractable protein and mineral contents. Indian J. med. Res. 38 1950 pp. 169-172.

12.—Alikunhi, K. H., Ganapati, S. V. & Rao, S. N. Notes on the life history of *Labeo calbasu* and *L. fimbriatus*. Proc. Indian Sci. Congr. 36th 3 1949 p. 159. [Abstract.]

13.—**Alikunhi, K. H. & Rao, S. N.** Observations on the bionomics and post larval development of the carnatic carp, *Barbus carnaticus* (Jerdon). Proc. Indian Sci. Congr. 36th 3 1949 p. 160. [Abstract.]

14.—**Alikunhi, K. H. & Rao, S. N.** Metamorphosis of *Elops indicus* Swainson, with notes on the metamorphosis of *Megalops cyprinoides* (Broussonet). Proc. Indian Sci. Congr. 36th 3 1949 p. 160. [Abstract.]

Alikunhi, J. H. see Ganapati, S. V.

Allee, W. C. see Frank, P.

15.—**Allen, K. R.** Some aspects of the production and cropping of fresh waters. Trans. Roy. Soc. N.Z. 77 1949 pp. 222-228.

16.—**Allison, L. N.** Common diseases of fish in Michigan. Misc. Publ. Michigan Dept. Conservation No. 5 1950 pp. 1-27 22 text-figs.

17.—**Alm, G.** Fertilization experiments with salmon-parr. Rep. Inst. Freshwater Res. Drottningholm 22 1943 pp. 1-40 7 text-figs.

18.—**Alm, G.** Reasons for the occurrence of stunted fish populations (with special regard to the perch). Rep. Inst. Freshwater Res. Drottningholm 25 1946 pp. 1-146 23 text-figs.

19.—**Alm, G.** Influence of heredity and environment on various forms of trout. Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 29-34 2 text-figs.

20.—**Alm, G.** Preliminary reports of certain experiments with a view to exploiting lakes empty of fish. Rep. Inst. Freshwater Res. Drottningholm 31 1950 pp. 19-25 1 fig.

21.—**Alm, G.** The Sea-Trout population in the Åva Stream. Rep. Inst. Freshwater Res. Drottningholm 31 1950 pp. 26-56, 3 figs. 17 tabs.

22.—(**Alpatov, V. V. & Stroganov, N. S.**) New unit of measurement of the activity of hypophysis in fishes. C.R. Acad. Sci. Moscow N.S. 74 1950 pp. 405-407. [In Russian.]

23.—**Altnöder, K.** Die Frühjahr- und Herbstheringe von Rügen. Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart (N.F.) 11 1948 pp. 247-257, 2 figs.

24.—**Alvarez, J.** El cultivo de peces en estanques artificiales. Rev. Soc. Mex. Hist. nat. 7 1946 pp. 75-85.

25.—**Alvarez, J.** Descripción de una nueva especie de *Mollienisia* capturada en Baños del Azufre, Tabasco (Pisces, Poeciliidae). An. Esc. nac. Cienc. biol. Mexico 5 1948 pp. 275-281 text-figs. 1-2.

26.—**Alvarez, J.** Claves para la determinación de especies en los peces de las aguas continentales mexicanas. Mexico 1950 pp. 1-144 16 text-figs.

27.—**Amaral Campos, A.** Sobre a subfamília Bryconinae. Espécies existentes na coleção de peixes do departamento de zoologia de São Paulo. Pap. Avulsos Dept. Zool. S. Paulo 9 1950 pp. 137-143 1 text-fig.

28.—**Ammann, E.** Fischereiwirtschaft und Hydrobiologie. Schweiz. Z. Hydrol. 12 1950 pp. 516-521.

29.—**Anadon, E.** Sobre la sustitucion alternativa en el litoral gallego de los Clamados peces emigrantes (sardina, espadin, anchoa y jurel.) Bol. Inst. Esp. Oceanogr. No. 24 1950 pp. 1-20 9 text-figs.

30.—**Ananiadis, C.** Study on the biology of the red mullet *Mullus barbatus* (Rond) forma *typica* (Fage.) Prakt. Hellenic Hydrobiol. Inst. 3 2 1949 pp. 85-150 11 figs. tables. [English summary.]

31.—**Ancellin, J.** Statistiques biologiques et considerations sur les populations de harengs de la Manche orientale et du Sud de la Mer du Nord. Rev. Trav. Pêches marit., Paris 14 1948 pp. 27-32 ? text-figs.

32.—**Ancona, U. d'.** Ulteriori osservazioni e considerazioni sull' ermafroditismo e il differenziamento sessuale dell' orata (*Sparus auratus* L.) Pubbl. Staz. zool. Napoli 18 1941 pp. 313-336. 1 pl. 2 figs.

33.—**Ancona, U. d'.** Ermafroditismo ed intersessualita nei Teleostei. C.R. 13e Congr. int. Zool. Paris 1948 [1949] pp. 144-146.

34.—**Anderson, A. W. & Power, E. A.** Fishery statistics of the United States: 1946 and 1947. Statist. Digest U.S. Fish Wildlife Serv. Nos. 19 & 21 1950.

Anderson, G. C. see Larkin, P. A.

- 35.—Andersson, K. A. The herring fishery and the stock of herring in the northern North Sea and the Skagerak during the season 1949–50. J. Conseil, Copenh. **17** 1950 pp. 40–43 1 fig.
- 36.—Andreu, B. Nota sobre un cherne (*Epinephelus caninus* Val.) de gran tamaño pescado en el delta del Ebro. Bol. Soc. esp. Hist. nat. **47** 1949 1–2 pp. 45–48 2 text-figs.
- 37.—Andreu, B. Sobre la maduración sexual de la anchoa (*Engraulis encrasicolus* L.) de las costas norte de España. Datos biológicos y biométricos. Publ. Inst. Biol. apl. Barcelona **7** 1950 pp. 7–36 2 pls. 27 figs. [English summary.]
- 38.—Andreu, B., Rodríguez-Roda, J. & Larraneta, M. G. Contribución al estudio de la talla edad y crecimiento de la sardina (*Sardina pilchardus* Walb.) de las costas españolas de Levante (Noviembre 1949– Mayo 1950.) Publ. Inst. Biol. apl. Barcelona **7** 1950 pp. 159–189 2 pls., 11 figs. tables.
- 39.—Angot, M. Poissons littoraux de Soalara. Cartes des fonds.—Systematique. Observations biologiques possibilités de pêche Européenne. Mém. Inst. Sci. Madagascar **4A** 1950 pp. 175–196 5 figs.
- 40.—Anon. Kalojemme nimien vaikuttaminen. Fisk. Tidskr. Finl. **57** 1950 pp. 126–128 8 text figs.
- Applegate, V. C. see Carbine, W. F.
- Arakawa, K. see Migita, M.
- Ardiwinata, R. O. see Hofstede, A. E.
- 41.—Arthur, D. R. Abnormalities in the sexual apparatus of the dogfish (*Scyliorhinus caniculus*). Proc. Linn. Soc. Lond. **162** 1950 pp. 52–56 3 figs.
- 42.—Atz, J. W. Fishes from deserts and caves. Animal Kingdom, N.Y. **53** 1950 pp. 87–90 3 text-figs.
- 43.—Atz, J. W. Strange animal lures. Animal Kingdom, N.Y. **53** 1950 pp. 110–113, 6 figs.
- 44.—Aurich, H. J. Die Verbreitung der pelagischen Fischbrut in der südlichen Nordsee während der Frühjahrsfahrten 1926–1937 der deutschen Forschungsschiffe "Poseidon" und "Makrele." Helgol. wiss. Meeresuntersuch. **2** 1941 pp. 183–225 16 figs.
- 45.—Avnimelech, M. On vertebrate remains in Senonian Phosphate Beds of Transjordan. Ecl. geol. helv. **42** 1950 pp. 486–490 figs. 1–2.
- 46.—(Baburina, E. A.) Activity of the nucleus of the retort shaped visual cell in Teleostean fishes. C.R. Acad. Sci. Moscow N.S. **72** 1950 pp. 389–391 figs. [In Russian.]
- 47.—(Baburina, E. A.) Development of retina in Amuran *Hemiculter leucisculus* (Basilewsky). C.R. Acad. Sci. Moscow N.S. **74** 1950 pp. 369–372 figs. [In Russian.]
- Bacelar, A. see Frade, F.
- 48.—Baerends, G. P. & Baerends, J. M. An introduction to the study of the ethology of Cichlid fishes. Behaviour, Leiden. 1950 Suppl. 1 242 pp. 60 text-figs.
- 49.—Bahamonde, N. Alimentación del Peje-Gallo (*Callorhynchus callorhynchus*). Invest. zool. chil. **1** 1950 pp. 4–6 1 tab.
- 50.—Bahamonde, N. Alimentación del Rollizo (*Pinguipes chilensis* Molina 1782). Invest. zool. chil. **2** 1950 pp. 13–14, 1 tab.
- 51.—Bailey, J. R. A new subspecies of the Darter *Hololepis barratti* from Western North Carolina. Copeia **1950** pp. 311–316 2 tabs.
- 52.—Bailey, R. M. & Miller, R. R. *Mollienesia* versus *Mollienisia* as the name for a genus of Poeciliid fishes. Copeia **1950** p. 318.
- 53.—Bailey, R. M. & Taylor, W. R. *Schillbeodes hildebrandi*, a new ameiriid catfish from Mississippi. Copeia **1950** pp. 31–38 2 pls.
- 54.—Baissac, J. de B. Contribution à l'étude des poissons de l'île Maurice. III. Les rougets. Proc. R. Soc. Arts Sci. Mauritius **1** 1950 pp. 25–31.
- 55.—Bal, D. V. & Bapat, S. V. The food of some post-larval Clupeoids. Proc. Indian Sci. Congr. **36th** 3 1949 p. 162. [Abstract.]
- 56.—Bal, D. V. & Bapat, S. V. The food habits of some young Sciaenids. Proc. Indian Sci. Congr. **36th** 3 1949 pp. 162–163. [Abstract.]

57.—(Balabai, P. P.) The time needed in metamorphosis of *Lampetra mariae* Berg. Trud. Inst. Zool. Akad. Nauk Ukr. R.S.R. 1948 1 pp. 29-38 figs. [In Ukrainian.]

58.—Ball, R. C. Fertilization of natural lakes in Michigan. Trans. Amer. Fish. Soc. **78** (1948) 1950 pp. 145-155.

Bapat, S. V. *see* Bal, D. V.

59.—Barabash-Nikiforov, I. I. Fauna of desman's burrow as an environmental factor influencing its life. C.R. Acad. Sci. Moscow N.S. **71** 1950 pp. 933-936. [In Russian.]

60.—(Baranova, I. A.) The various functions of basophile cells in the hypophyses of different biological groups of *Acipenser guldenstädti* Borodin. C.R. Acad. Sci. Moscow N.S. **74** 1950 pp. 1033-1036 figs. [In Russian.]

61.—Bardan, E. & Navarro, F. Nuevos datos sobre la sardina de Malaga. Bol. Inst. Esp. Oceanogr. **34** 1950 pp. 1-4 4 tabs.

62.—Baron, J. Musculature extrinsèque et équilibre des poissons. C.R. Acad. Sci. Paris **230** 1950 pp. 2231-2233.

63.—Baron, J. Relations entre les muscles moteurs oculaires, les nageoires et l'équilibre des Poissons. C.R. Acad. Sci. Paris **231** 1950 pp. 1087-1088.

64.—Barraclough, W. E. An inshore record of the bathypelagic fish, *Chauliodus macouni* Bean from British Columbia. Copeia **1950** pp. 241-242.

65.—Barsukov, V. V. The age of *Coregonus muksun* in Ob river. C.R. Acad. Sci. Moscow N.S. **74** 1950 pp. 1131-1134. [In Russian.]

66.—Barton, O. A new *Siganus*, from the Great Barrier Reef, Australia. Amer. Mus. Novit. No. 1464 1950 pp. 1-2 1 fig.

67.—Basu, S. R. Ecology of sewage-irrigated fisheries in the Bidyadhari spill area, with particular reference to the bionomics of carps cultured therein. Proc. nat. Inst. Sci. India **16** 1950 pp. 366-367.

Battaglia, B. *see* Tanzi, B.

68.—Baughman, J. L. Random notes on Texas fishes. Pt. I. Texas J. Sci. **2** 1950 pp. 117-138.

69.—Baughman, J. L. Random notes on Texas fishes. Pt. II. Texas J. Sci. **2** 1950 pp. 242-263.

70.—Baughman, J. L. & Springer, S. Biological and economic notes on the sharks of the Gulf of Mexico, with special reference to those of Texas, and with a key for their identification. Amer. midl. Nat. **44** 1950 pp. 96-152 19 text-figs.

71.—Bauzá Rullán, J. Sobre el hallazgo del *Prolebias cf. gregatus* Sauvage en el oligoceno de sarreal. Bol. Soc. esp. Hist. nat. **47** 1949 pp. 93-95 pl. 8.

72.—Bauzá Rullán, J. Contribuciones al conocimiento de la fauna ictiológica fósil de Mallorca. Bol. Soc. esp. Hist. nat. **47** 1950 (1949) pp. 203-217 2 text-figs. pls. xiii-xvi.

73.—Bauzá Rullán, J. Peces eocénicos de Cataluña (Segunda Parte). Bol. Soc. esp. Hist. nat. **47** 1950 pp. 345-349 pl. 18.

74.—Bauzá Rullán, J. Sobre el hallazgo del *Balistes lerichei* n. sp. en el vindoboniense de Santa Margarita (Mallorca). Bol. Soc. esp. Hist. nat. **47** 1950 pp. 519-520 pl. 27.

75.—Bauzá Rullán, J. Sobre el hallazgo de los géneros *Box*, *Diplodus* y *Pagellus* en el plaisanciense de Son Talapi (Llubi) Mallorca. Bol. Soc. esp. Hist. nat. **47** 1950 (1949) pp. 653-655 pl. 28.

76.—Becker, E. *Pachypanchax playfairi* Günther 1866. Wschr. Aquar. Terrarien. Braunschweig **44** 1950 pp. 161-163 1 text-fig.

77.—Beckman, W. C. The length-weight relationship, factors for conversions between standard length and total length, and coefficients of condition for seven Michigan fishes. Trans. Amer. Fish. Soc. **75** (1945) 1948 pp. 237-256.

78.—Beckman, W. C. The rate of growth and sex ratio for seven Michigan fishes. Trans. Amer. Fish. Soc. **76** (1946) 1949 pp. 63-81.

79.—Beckman, W. C. Changes in growth rates of fishes following reduction in population densities by winterkill. Trans. Amer. Fish. Soc. **78** (1948) 1950 pp. 82-90.

80.—Behre, E. H. Annotated list of the fauna of the Grand Isle region. Occas. Pap. mar. Lab. Baton Rouge, La. No. 6 1950 pp. 1-66.

81.—Bell, G. M. & Hoar, W. S. Some effects of ultraviolet radiation on sock-eye salmon eggs and alevins. Canad. J. Res. **28D** 1950 1 pp. 35-43 2 pls. 2 text-figs.

Bell, G. M. *see* Hoar, W. S.

82.—Belloc, G. Catalogue des types de poissons du Musée Océanographique de Monaco. Bull. Inst. océanogr. Monaco No. 958 1949 pp. 1-23 3 pls.

83.—Bellomy, M. D. Fishes that sound off. Frontiers, Philad. Pa **14** 1950 pp. 132-134 3 text-figs.

84.—Bellón, L. Pesca y utilización del boquerón y de la sardina en las costas de Málaga. Bol. Inst. Esp. Oceanogr. No. 30 1950 pp. 1-114 13 pls. 56 text-figs.

85.—Bellón, L. Note sur la Pêche et l'Utilisation de la Sardine des Côtes de Málaga, (*Sardina pilchardus* Walb.) Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 80-87 8 figs.

86.—Bemmelen, J. F. van. De Verwantschap der Cyclostomen. Proc. K. ned. Akad. Wet. Amsterdams **53** 1950 pp. 273-288. [Dutch with English summary.]

87.—Bennion, B. Trout culture in South Africa. Salmon & Trout Mag. No. 130 1950 pp. 219-226.

88.—Berg, L. S. Fresh-water fish of Iran and of neighbouring Countries. Trav. Inst. Zool. Acad. Sci. U.R.S.S. **8** 1949 pp. 783-858 illust. [In Russian.]

89.—Berrill, N. J. The Crucifix fish. Nat. Hist., N.Y. **59** 1950 pp. 168-171 10 photographs.

90.—Berrill, N. J. Hitchhiker of the sea. Nat. Hist., N.Y. **59** 1950 pp. 328-329 4 figs.

91.—Bertin, L. Systématique et écologie des poissons abyssaux. C.R. **13e** Congr. int. Zool. Paris 1948 [1949] pp. 349-365.

92.—Bertin, L. & Dollfus, R. P. Révision des espèces du genre *Decapterus* (Téléostéens Scombriformes). Mém. Mus. Hist. nat. Paris N.S. **26** 1948 pp. 1-29 2 pls. 7 figs.

93.—Bérzins, B. Sur Limnologie der Seen Südostlettlands. Schweiz. Z. Hydrol. Basel **11** 1949 pp. 583-607 3 text-figs.

94.—Bhatia, B. Adaptive modifications in a hill-stream catfish, *Glyptothorax telchitta* (Hamilton). Proc. nat. Inst. Sci. India **16** 1950 pp. 271-285 10 figs.

Bhattacharya, R. N. *see* Mookerjee, H. K.

95.—Bhimachar, B. S. & George, P. C. Abrupt set-backs in the fisheries of the Malabar and Kanara coasts and "red water" phenomenon as their probable cause. Proc. Indian Acad. Sci. **31B** 1950 pp. 339-350 1 graph.

Bhimachar, B. S. *see* Nair, R. V.

96.—Bigelow, H. B. & Schroeder, W. C. New and little known cartilaginous fishes from the Atlantic. Bull. Mus. comp. Zool. Harvard **103** 1950 pp. 385-408 7 pls.

97.—Binkley, L. E. The interpretation of fish scale readings in fishery management. Proc. West Va. Acad. Sci. **21** 1949 pp. 45-47.

98.—Bishop, S. C. Response of Minnows to earth vibrations. Copeia **1950** p. 318.

99.—Bistrov, A. P. Microscopical structure of bones and teeth in the Carboniferous fish *Megalichthys* (Fam. Osteolepidae.) C.R. Acad. Sci. Moscow N.S. **74** 1950 pp. 119-121 3 figs.

100.—Bjerkas, P. The Biological Condition of the Sprat Stock along the Norwegian Coast. Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 89-91.

101.—Blackburn, M. Fishery management and changes in abundance of fish. Aust. J. Sci. **12** 1949 pp. 14-17.

102.—Blackburn, M. Age, rate of growth, and general life-history of the Australian pilchard (*Sardinops neopilchardus*) in New South Wales waters. Bull. Commonw. sci. industr. Res. Org. Aust. No. 242 1949 pp. 1-86, 8 pls. 8 figs. tables.

103.—Blackburn, M. The barracouta, *Thyrssites atun* (Euphrasen), in Australian waters: preliminary notes on the biology and condition and future of the fishery. Commonw. Sci. industr. Res. Org. Austr. Contr. **93** 1949 pp. 1-61 14 text-figs tables.

104.—Blackburn, M. A biological study of the anchovy, *Engraulis australis* (Waite), in Australian waters. Aust. J. Mar. & Freshwater Res. **1** 1950 pp. 3-84 5 pls. 11 text-figs.

105.—Blackburn, M. The condition of the fishery for barracouta, *Thyrsites atun* (Euphrasen), in Australian waters. Aust. J. Mar. & Freshwater Res. **1** 1950 pp. 110-128 2 pls. 4 text-figs.

106.—Blackburn, M. & Tubb, J. A. Measures of abundance of certain pelagic fish in some south-eastern Australian waters. Bull. Commonw. sci. industr. Res. Org. Aust. No. 251 1950 pp. 1-74 2 pls. 3 figs. tables.

107.—Blair, A. P. Some cold-blooded vertebrates of the Oklahoma Panhandle. Copeia **1950** p. 234.

108.—Blanc, M. Convergence morphologique des épines des nageoires de labridés et de poisson-chats. Feuille Nat. Paris N.S. **5** 1-2 1950 pp. 11-12. 1 text-fig.

109.—Blegvad, H. Sneppefiskens, *Macroramphus scolopax*, i danske Farvande. Vidensk. Medd. Dansk. naturh. Foren. **107** 1944 pp. 367-369 1 fig.

110.—Böhlke, J. E. A new record of the snipe eel (*Nemichthys*) from California waters. Proc. Calif. zool. Cl. **1** 1950 pp. 41-43.

Böhlke, J. E. *see* Myers, G. S.

111.—Bolin, R. L. Remarks on Cottid fishes occasioned by the capture of two species new to California. Copeia **1950** pp. 195-202 1 fig.

112.—Bolin, R. L. & Myers, G. S. Station records of the Crocker-Stanford deep-sea expedition, coast of California, September 1938. Stanford Ichthyol. Bull. **3** 1950 pp. 203-208.

113.—Bondesen, P. Nye fund for dansk fauna. Medd. nat. hist. mus. Aarhus **2** 1950 No. 17 pp. 1-6. [Danish with English summary.]

114.—Bont, A. F. de. Danger de l'introduction de poissons exotiques. Proc. & Pap. Intern. tech. Conf. Protect. Nature, Paris **1949** 1950 pp. 413-415.

115.—Borisov, P. G. Contemporary methods to discover fish shoals in the sea. Bull. Soc. Nat. Moscow Sect. Biol. **55** 1950 pp. 86-96 figs. [In Russian.]

Borisovskaya, E. N. *see* Trifonova, A. N.

116.—Borissenko, A. Sur la biologie de *Mullus barbatus* L. de la mer Noire. Trav. Sta. biol. Karadagh No. **6** 1940 pp. 23-40 2 figs. tables. [Russian with French résumé.]

Botke, F. *see* Hofstede, A. E.

117.—Bougis, P. Caractères distinctifs des deux espèces du genre *Mullus*: *M. surmuletus* L. et *M. barbatus* L. Bull. Mus. Hist. nat. Paris (**2**) **21** 1949 pp. 522-525 2 text-figs.

118.—Bougis, P. Rapport hépatosomatique et rapport gonosomatique chez *Mullus barbatus* L. Bull. Soc. zool. Fr. **74** 1949 pp. 326-330 2 text-figs.

119.—Bougis, P. Sur un allongement des nageoires pectorales, corrélatif d'un changement de milieu, chez les jeunes *Mullus*. Vie et Milieu, Paris **1** 1950 pp. 243-247 1 graph.

120.—Brander, T. Faunistiska iakttagelser i kiviärvi — trakten i Urdiala (Ta). Memoranda Soc. Fauna fenn. Helsingfors **25** 1950 pp. 121-135.

121.—Breder, C. M. Factors influencing the establishment of residence in shells by tropical shore fishes. Zoologica, N.Y. **35** 1950 pp. 153-158 2 pls. 5 figs.

122.—Breder, C. M. & Rasquin, P. A preliminary report on the role of the pineal organ in the control of pigment cells and light reactions in recent Teleost fishes. Science **111** 1950 pp. 10-12 1 text-fig.

123.—Breland, O. P. Animal Facts and Fallacies. New York, 1948.

124.—Brett, J. R. The physical limnology of Lakelse Lake, British Columbia. J. Fish. Res. Board, Canada **8** 1950 pp. 82-102 8 text-figs.

125.—Brett, J. R. & McConnell, J. A. Lakelse Lake sockeye survival. J. Fish. Res. Board, Canada **8** 1950 pp. 103-110 2 text-figs.

126.—Brongersma-Sanders, M. On the occurrence of fish remains in fossil and recent marine deposits. Bijdr. Dierk. Leiden **28** 1949 pp. 65-76.

127.—Brooks, J. L. Speciation in ancient lakes. Quart. Rev. Biol., Baltimore **25** 1950 pp. 30-60 5 text-figs. and pp. 131-176 8 figs. tables.

128.—Broughton, W. B. A two-spined stickleback in the river Roding. *Essex Nat.* **28** 1950 pp. 207–208.

129.—Brown, R. W. Cretaceous fish egg capsule from Kansas. *J. Paleont., Menasha Wis.* **24** 1950 pp. 594–600 text-figs. 1–9.

130.—Browne, M. J., Pitts, M. W. & Pitts, R. F. Alkaline phosphatase activity in kidneys of glomerular and aglomerular marine teleosts. *Biol. Bull. Woods Hole* **99** 1950 pp. 152–156 1 pl.

131.—Bruun, A. F. & Kaiser, E. W. *Iranocypris typhlops* n. g., n. sp., the first true cave-fish from Asia. *Danish Scient. Invest. Iran, Copenhagen* [1944] pt 4 pp. 1–8 5 text-figs.

132.—Bückmann, A. Die Entwicklung des Grundfischfanges in der Nordsee 1919–1938 und die sich daraus ergebenden Folgerungen für die künftige Gestaltung der Fischerei. *Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart (N.F.)* **11** 1948 pp. 282–360, 25 figs. 33 tabs.

133.—Bückmann, A. & Ulbricht-Stier, A. Die wichtigsten Ergebnisse der Kabeljau-untersuchungen der Biologischen Anstalt im Seegebiet von Helgoland. *Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart (N.F.)* **11** 1949 pp. 406–428, 5 figs., 2 charts.

134.—Buddenbrock, W. v. Vergleichende Physiologie 4 Hormone, Basel (Birkhäuser) 1950 pp. 492 134 figs.

135.—Budker, P. Note préliminaire sur le placenta et le cordon ombilical de trois selaciens vivipares de la côte occidentale d'Afrique. *C.R. 13e Congr. int. Zool. Paris* 1948 [1949] pp. 337–338.

136.—Buen, F. de. Ictiogeografía continental mexicana (I, II y III). *Rev. Soc. Mexicana Hist. nat.* **7** 1–4 1946 pp. 87–138.

137.—Buen, F. de. El Mar de Solis y su Fauna de Peces (2 Parts). *Publ. Cient. Serv. Oceanogr. Montevideo* **1** 1949 pp. 1–43 and **2** 1950 pp. 45–144.

Bulatova, N. *see* Korshuyev, P.

138.—Burns, J. & Copeland, D. E. Chloride excretion in the head region of *Fundulus heteroclitus*. *Biol. Bull. Woods Hole* **99** 1950 pp. 381–385, 7 figs.

Burrows, C. R. *see* Moyle, J. B.

139.—Busch, G. Die Ichthyophthiriasis, eine gefährliche Fischkrankheit. *Wschr. Aquar. Terrarienk., Braunschweig* **44** 1950 pp. 208–210 1 text-fig.

140.—Buser, J. La prégnéninone utilisée comme facteur antithyroïdien et son rôle inhibiteur sur la régénération chez *Lebistes reticulatus* R. et *Ameiurus nebulosus*, L. *Bull. Soc. zool. Fr.* **75** 1950 pp. 75–80 3 figs.

141.—Buser, J. Etude des phénomènes de régénération chez quelques poissons téléostéen Méditerranéens. *Vie et Milieu, Paris* **1** 1950 pp. 248–251 1 graph.

142.—Buser, J. Hypophysectomie et régénération chez les poissons téléostéens. *Vie et Milieu, Paris* **1** 1950 pp. 252–254.

143.—Buser, P. & Scherrer, J. Potentiels d'action du nerf optique chez le poisson-chat. *C.R. Soc. Biol. Paris* **144** 1950 pp. 892–894 2 figs.

144.—Butcher, A. D. The freshwater fish of Victoria and their food. Melbourne, [1947.]

145.—Butler, R. L. & Smith, L. L. The age and rate of growth of the sheephead, *Aplodinotus grunniens* Rafinesque, in the upper Mississippi River navigation pools. *Trans. Amer. Fish. Soc.* **79** (1949) 1950 pp. 43–54.

146.—Cable, L. E. A cheek tag for marking fish, with semi-automatic pliers for application of tag. *J. Conseil, Copenh.* **16** 1950 pp. 185–191 2 text-figs.

147.—Cade, — Preliminary report on breeding *Nothobranchius taeniopygus* in captivity. *J. E. Afr. nat. Hist. Soc.* **19** 3–4 1946 p. 131.

148.—Cadenat, J. Description de quatre Téléostéens nouveaux de la cote occidentale d'Afrique. *Bull. Mus. Hist. nat. Paris* (2) **21** 1949 pp. 663–671 4 text-figs.

149.—Calhoun, A. J. & Woodhull, C. A. Progress report on studies of striped bass reproduction in relation to the Central Valley project. *Calif. Fish Game* **34** 1948 pp. 171–188 1 pl. 6 tabs. 2 maps. 3 figs.

150.—Callamand, O. Aptitude de l'Anguille (*Anguilla anguilla* L.) à former des antitoxines. Rapports possibles avec les mystères de sa reproduction. Bull. Mus. Hist. nat. Paris (2) 21 1949 pp. 512-515.

Campos, A. A. *see* Amaral Campos, A.

151.—Carbine, W. F. & Applegate, V. C. The fish population of deep lake Michigan. Trans. Amer. Fish. Soc. 75 (1945) 1948 pp. 200-227.

152.—Caribbean Commission. The Fish Trade of the Caribbean. Washington D.C. 1948.

153.—Carl, G. C. The distribution of fresh-water fishes in British Columbia. Rep. Prov. Mus. Victoria, B.C. 1949 1950 pp. B21-23.

154.—Carlander, K. D. The Iowa co-operative fisheries research program. Proc. Iowa Acad. Sci. 56 [1950] pp. 325-331.

155.—Carr, A. F. & Giovannoli, L. The fishes of the Choluteca drainage of Southern Honduras. Occ. Pap. Mus. Zool. Univ. Mich. No. 523 1950 pp. 1-38 2 pls.

156.—Carter, A. L. Notes on the stratigraphical occurrences of the Palaeozoic fishes as evidenced by fauna collected in Western New York. Hobbies, Buffalo, N.Y. 30 4 1950 pp. 68-73 3 figs.

157.—Casier, E. Contributions à l'étude des poissons fossiles de la Belgique. G. La faune des formations dites "paniséliennes." Bull. Inst. R. Sci. nat. Belg. 26 42 1950 52 pp. 2 pls.

Casier, E. *see* Darteville, E.

158.—Catala, R. Contribution à l'étude écologique des îlots coralliens, du Pacifique Sud. Premiers éléments d'écologie terrestre et marine des îlots voisins du littoral de la Nouvelle Calédonie. Bull. biol., Paris 84 1950 pp. 234-315 2 pls. 19 figs.

159.—Chabanaud, P. Contribution à la morphologie du tube digestif des Téléostéens dyssymétriques. Mém. Mus. Hist. nat. Paris N.S. 20 1947 pp. 123-139 16 figs.

160.—Chabanaud, P. Essai d'une division biogéographique du domaine océanique. C.R. 13e Congr. int. Zool. Paris 1948 [1949] pp. 535-538.

161.—Chabanaud, P. Révision des Cynoglossidae (s. str.) de l'Atlantique oriental. Bull. Mus. Hist. nat. Paris (2) 21 1949 pp. 60-66.

162.—Chabanaud, P. Révision des Cynoglossidae (s. str.) de l'Atlantique oriental (suite). Bull. Mus. Hist. nat. Paris (2) 21 1949 pp. 202-209.

163.—Chabanaud, P. Révision des Cynoglossidae (s. str.) de l'Atlantique oriental (suite et fin). Bull. Mus. Hist. nat. Paris (2) 21 1949 pp. 347-353.

164.—Chabanaud, P. Les *Cynoglossus* de l'Atlantique. Bull. Mus. Hist. nat. Paris (2) 21 1949 pp. 516-521.

165.—Chabanaud, P. Notules ichthyologiques (suite). XXXIX. Présence de *Bathysolea profundicola* dans la Méditerranée. XL. Sur les *Synaptura* du groupe *albomaculata*. XLI. L'œuf des Rhombosoleidae. Bull. Mus. Hist. nat. Paris (2) 21 1949 pp. 672-675.

166.—Chabanaud, P. Sur l'appareil pleurographique des Soleoidei dans ses rapports avec l'orientation de la dyssymétrie. Bull. Soc. zool. Fr. 74 1949 pp. 99-103.

167.—Chabanaud, P. Sur deux espèces de poissons du genre *Symphurus* de l'Atlantique oriental. Ann. Mag. nat. Hist. (12) 3 1950 pp. 624-627.

168.—Chabanaud, P. Description de nouveaux Soleidae capturés au cours de l'expédition océanographique belge dans les eaux africaines de l'Atlantique Sud (1948-1949). Bull. Mus. Hist. nat. Belg. 26 No. 55 1950 pp. 1-19.

169.—Chabanaud, P. Notules ichthyologiques. XLII-XLVI. Bull. Mus. Hist. nat. Paris (2) 22 1950 pp. 336-340 1 fig.

170.—Chabanaud, P. Description d'un nouveau Soléidé originaire de la Côte Orientale du Queensland. Bull. Mus. Hist. nat. Paris (2) 22 1950 pp. 563-567.

171.—Chabanaud, P. Contribution à l'anatomie et à la systématique de la famille des Bothidae, s. str. Bull. Soc. zool. Fr. 74 1950 pp. 246-253 8 text-figs.

172.—Chacko, P. I. On the nutrition of the young stages of certain estuarine fishes of Madras. Proc. Indian Sci. Congr. 36th 3 1949 pp. 163-164. [Abstract.]

173.—Chacko, P. I. Bionomics of *Lepidocephalichthys thermalis* (Cuv. and Val.) in the Madras waters. Proc. Indian Sci. Congr. 36th 3 1949 p. 164. [Abstract.]

174.—Chacko, P. I. Migratory movements of fishes of the Coleroon. Proc. Indian Sci. Congr. 36th 3 1949 pp. 164–165. [Abstract.]

175.—Chacko, P. I. Observation on fishes of the Vellar Estuary, Porto Novo. Proc. Indian Sci. Congr. 36th 3 1949 p. 165. [Abstract.]

176.—Chacko, P. I. Fisheries of the Upper Godavari, with special reference to the Ramapadasagar project. Proc. Indian Sci. Congr. 36th 3 1949 p. 165. [Abstract.]

177.—Chacko, P. I. The Krishna river and its fishes. Proc. Indian Sci. Congr. 36th 3 1949 pp. 165–166. [Abstract.]

178.—Chacko, P. I. A biometrical study of *Hilsa ilisha* (Ham.) in the Godavari River. J. Bombay nat. Hist. Soc. 49 1950 pp. 315–316 tables.

179.—Chacko, P. I. A note on the bionomics of *Lepidocephalus thermalis* (Cuv. & Val.). Sci. & Culture, Calcutta 15 1950 pp. 281–282.

180.—Chacko, P. I. & Dinamani, P. Preliminary report on the fishery resources of the Bhavani river in relation to the Lower Bhavani project. Proc. Indian Sci. Congr. 36th 3 1949 p. 166. [Abstract.]

181.—Chacko, P. I. & Dinamani, P. An ecological reconnaissance of the fishes of the Red Hills Lake. Proc. Indian Sci. Congr. 36th 3 1949 p. 166–167. [Abstract.]

182.—Chacko, P. I. & Ganapati, S. V. On a case of phenomenal growth of the Indian carp, *Catla catla* (Cuv. & Val.) in two tanks of Kancheepuram. Sci. & Culture, Calcutta 16 1950 pp. 28–30.

183.—Chacko, P. I. & Ganapati, S. V. On the bionomics of the carp, *Thynnichthys sandkhoh* (Sykes). Sci. & Culture, Calcutta 15 1950 pp. 484–485 tables.

184.—Chacko, P. I. & Krishnamurthi, B. Hermaphroditism in the Indian shad, *Hilsa ilisha* (Ham.) Proc. Indian Sci. Congr. 36th 3 1949 p. 167. [Abstract.]

185.—Chacko, P. I. & Krishnamurthi, B. Notes on *Hilsa kanagurta* (Bleeker) and *Hilsa toli* (Cuv. and Val.). Proc. Indian Sci. Congr. 36th 3 1949 p. 167. [Abstract.]

186.—Chacko, P. I. & Krishnamurthi, B. Notes on *Hilsa kanagurta* (Bleeker) and *Hilsa toli* (Cuv. and Val.). Sci. & Culture, Calcutta 15 1949 pp. 118–119.

187.—Chacko, P. I. & Kuriyan, G. K. Feeding and breeding habits of the common carps of south India. Proc. Indian Sci. Congr. 36th 3 1949 p. 167. [Abstract.]

188.—Chacko, P. I. & Kuriyan, G. K. The bionomics of the carp *Catla catla* (Cuv. and Val.) in South Indian waters. Proc. zool. Soc. Lond. 120 1950 pp. 39–42.

189.—Chacko, P. I. & Mathews, M. J. Food and feeding habits of certain fishes of the Tungabhadra river. Proc. Indian Sci. Congr. 36th 3 1949 p. 167. [Abstract.]

190.—Chacko, P. I. & Mathews, M. J. Preliminary report on the fishery biology of the Tungabhadra project, Hospet. Proc. Indian Sci. Congr. 36th 3 1949 p. 168. [Abstract.]

191.—Chacko, P. I. & Subramanian, S. Food and feeding habits of *Labeo boggot* (Sykes). Proc. Indian Sci. Congr. 36th 3 1949 p. 168. [Abstract.]

Chacko, P. I. see Ganapati, S. V.

Champagne, R. see Dieuzeide, R.

192.—Chance, C. J. Fish catch in Bedford and Tullahoma lakes, Tennessee, with special reference to soil productivity. J. Tenn. Acad. Sci. 25 1950 pp. 157–168.

193.—Cheng, Ching-Tai. Note sur les poissons des eaux douces du Yunnan, Chine, des collections du museum. Bull. Mus. Hist. nat. Paris (2) 21 1949 pp. 526–531.

194.—Cheng, Ching-Tai. Description d'un genre nouveau du Yunnan, Chine, appartenant a la sous-famille des Cyprinines, s. str. Bull. Mus. Hist. nat. Paris (2) 22 1950 pp. 568–570.

195.—[Chernigin, M. F.] "Electric Net." Tekhnika Molodezhi, No. 10, Oct. 1949. [In Russian.] Summary in "Discovery," 10 p. 29 1950 (1 Fig.)

196.—Chidambaram, K. Studies on length frequency of the oil sardine, *Sardinella longiceps*, (Cuv. and Val.), and on certain factors influencing their appearance on the Calicut coast of Madras Presidency. Proc. Indian Acad. Sci. **31B** 1950 pp. 252-286 3 text-figs.

Ching-Tai Cheng *see* Cheng, C.-T.

197.—Chow, T. The fishery of Tung Ting Lake. Canton Fish Market, Publication No. 1 1948 pp. 22, 21 figs. [Abstract in Copeia, 1950 No. 1 p. 68.]

198.—Christiansen, M. & Jensen, A. J. C. On a recent and frequently occurring tumor disease in eel. Rep. Danish biol. Sta. No. 50 1950 pp. 29-44 11 text-figs.

199.—Chrzan, F. Investigations on the Baltic Cod. J. Conseil, Copenh. **16** 1950 pp. 192-207 5 text-figs.

Clague, J. A. *see* Warfel, H. E.

200.—Clark, C. F. Observations on the spawning habits of the northern Pike, *Esox lucius*, in Northwestern Ohio. Copeia **1950** pp. 285-288.

201.—Clark, E. Notes on the behaviour and morphology of some West Indian Plectognath fishes. Zoologica, N.Y. **35** 1950 pp. 159-168, 2 pls. 7 figs.

202.—Clark, F. N. & Daugherty, A. E. Average lunar month catch by California Sardine fishermen 1932-33 through 1948-49. Fish. Bull., Calif. **76** 1950 pp. 1-28 6 text-figs.

203.—Clarke, B. B. The Geology of Garnons Hill, etc. Trans. Woolhope Nat. Field Club **33** 1950 pp. 97-111 6 figs.

Clarke, G. M. *see* Perlmutter, A.

204.—Clarke, R. The bathypelagic angler fish *Ceratias holbölli* Kröyer. Discovery Rep. **26** 1950 pp. 1-32 1 pl. 2 figs. 3 tabs.

Clemens, W. A. *see* Larkin, P. A.

205.—Clowes, H. G. Rice production and utilization. Nature, Lond. **166** 1950 pp. 168-170.

206.—Coates, C. W. Double-tailed swordtail appears. Aquarium, Philad. **19** 1950 pp. 123-124 1 text-fig.

207.—Coates, C. W. Old fish do learn new tricks. Animal Kingdom, N.Y. **53** 1950 pp. 25-26 1 text-fig.

208.—Coates, C. W. and Nachmansohn, D. The electric eel is a useful tool. Animal Kingdom, N.Y. **53** 1950 pp. 35-40 4 text-figs.

209.—Connell, C. H. & Cross, J. B. Mass mortality of fish associated with the protozoan *Gonyaulax* in the Gulf of Mexico. Science **112** 1950 pp. 359-363 5 figs.

210.—Cooper, G. P. and Washburn, G. N. Relation of dissolved oxygen to winter mortality of fish in Michigan lakes. Trans. Amer. Fish. Soc. **76** (1946) 1949 pp. 23-33.

Copeland, D. E. *see* Burns, J.

211.—Corbin, P. G. Mackerel spawning in the south-western area. Challenger Soc. London **2** 20 1948 p. 17. [Abstract.]

212.—Corbin, P. G. Records of pilchard spawning in the English Channel. J. Mar. biol. Ass. U.K. **29** 1950 pp. 91-95 1 text-fig.

213.—Corbin, P. G. The occurrence of the smooth sand-eel, *Gymnanmodytes semisquamatus* (Jourdain), in the Plymouth area, with notes on *G. cicereus* (Rafinesque), and *G. capensis* (Barnard). J. Mar. biol. Ass. U.K. **29** 1950 pp. 83-89.

214.—Cordier, R. Les phénomènes d'athrocytose dans les toiles choroïdiennes du Téléostéen *Leuciscus rutilus* L. Bull. Acad. R. Belg. Cl. Sci. (5) **27** 1941 pp. 598-611 3 text-figs.

215.—Cotronei, G. Esperienze d'ibridazione nei Petromizonte. Pubbl. Staz. zool. Napoli **19** 1942 pp. 71-88 7 figs.

Coupe, R. *see* Furnest, J.

216.—Cox, K. W. Sablefish run at Monterey Bay. Calif. Fish Game **34** 1948 p. 37.

Crane, S. C. *see* Kritzler, H.

217.—Crawford, D. R. Common fresh-water fish of Maryland. Maryland Nat., Baltimore **19** 1949 pp. 49-52.

218.—Creac'h, P. Notes sur la Biologie et la Morphologie de la Sardine (*Sardina pilchardus* Walb.) dans le fond du Golfe de Gascogne. Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 30-36.

- 219.—Cross, F. B. Effects of sewage and of a headwaters impoundment on the fishes of Stillwater Creek in Payne County, Oklahoma. Amer. midl. Nat. **43** 1950 pp. 128-145 1 text-fig.
- Cross, F. B. see Moore, G. A.
- Cross, J. B. see Connell, C. H.
- 220.—Curtis, B. & Fraser, J. C. Koka-nee in California. Calif. Fish. Game **34** 1948 pp. 111-114 1 fig.
- 221.—Czopek, J. The structure of compound monsters in the embryos of the Dunajee sea-trout *Salmo trutta* L. and brown trout *Salmo trutta m. fario* L. II. C.R. Sci. math. nat. Acad. polon. **1950** 1-3 p. 11 [Abstract.]
- 222.—Daget, J. La ligne latérale : ses fonctions. Année Biol., Paris (3) **25** 1949 pp. 305-322.
- 223.—Daniel, R. J. A guide to marketable fish. Proc. Lpool biol. Soc. **57** Appendix I 1950 pp. 1-68 12 text-figs.
- 224.—Dannevig, A. The influence of the environment on number of vertebrae in plaice. Fiskeridir. Skrift. Havundersøk., Bergen **9** No. 9 1950 pp. 1-6.
- 225.—Dannevig, A. and G. Factors affecting the survival of fish larvae. J. Conseil, Copenh. **16** 1950 pp. 211-215.
- 226.—Dannevig, G. Sprat from Norwegian waters. An analysis of vertebrae counts. Fiskeridir. Skrift. Havundersøk., Bergen **9** No. 12 1950.
- 227.—Dartevelle, E. Un "Sun-Fish" *Mola mola* (Linné), à Banane. Zooleo, Leopoldville N.S. No. 8 1950 pp. 35-40 11 figs.
- 228.—Dartevelle, E. & Casier, E. Les poissons fossiles de l'Angola. II. Note complémentaire. Comm. Serv. geol. Portugal **27** 1946 p. 85-90.
- 229.—Dartevelle, E. & Casier, E. Les poissons fossiles du Bas-Congo et des Régions voisines. (Deux. partie.) Ann. Mus. Congo Belg. (3A) **2** 2 1949 pp. 201-256 pls. xvii-xxii.
- 230.—Dathe, H. Einige Beobachtungen über die Giftwirkung von *Trachinus*-Stichen. Deuts. Aquar. Terrar. Z., Stuttgart **3** 1950 pp. 36-39 6 text-figs.
- Daugherty, A. E. see Clark, F. N.
- 231.—David, K. Lautausserungen beim Grundling (*Gobio fluviatilis*). Zool. Anz. **134** 1941 pp. 90-91.
- 232.—Davies, D. H. A new species of *Macruronus* from South Africa. Ann. Mag. nat. Hist. (12) **3** 1950 pp. 512-515 1 text-fig.
- 233.—de Beer, G. R. Les trabecules du crane. C.R. **13e** Congr. int. Zool., Paris 1948 [1949] pp. 287-289.
- 234.—Dechaseaux, C. Les *Ceratodus* de Madagascar. Paléontologie de Madagascar xxvii. Ann. Paléont., Paris **35** 1949 pp. 73-86, 1 pl.
- Dembrow, V. D. see Klein, R. M.
- 235.—Denison, R. H. A new Arthro-dire from the New York State Devonian. Amer. J. Sci., New Haven **248** 1950 pp. 565-580 3 pls., 5 figs.
- 236.—Desbrosses, P. Le Merlan (*Gadus merlangus* L.) de la côte française de l'Atlantique. Rev. Trav. Pêches marit., Paris **14** 1948 pp. 71-104 12 text-figs.
- 237.—Desbrosses, P. Introduction à l'Etude des Caractères morphologiques métriques des Clupéidés. Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 23-29 3 figs.
- 238.—(Detlaf, T. A. & Ginzburg, A. C.) A case of parthenogenetic cleavage of nonovulated egg cells in the ovary of *Acipenser stellatus*. C.R. Acad. Sci. Moscow N.S. **72** 1950 pp. 429-432 figs. [In Russian.]
- 239.—Detwiler, S. R. Vertebrate Photoreceptors. New York 1943.
- 240.—Devillers, Ch. Role morphogénétique du cortex de l'oeuf de truite (*Salmo*). C.R. **13e** Congr. int. Zool., Paris 1948 [1949] pp. 284-286.
- 241.—Devillers, Ch. Le rôle du système sensoriel cephalique dans l'édification du crâne dermique des poissons. C.R. **13e** Congr. int. Zool. Paris 1948 (1949) pp. 290-293.
- 242.—Devillers, Ch. Rapport des os dermiques avec le système latéral. C.R. **13e** Congr. int. Zool. Paris 1948 [1949] pp. 293-297.
- 243.—Devillers, C. Action des solutions hypertoniques sur le développement de l'oeuf de truite. C.R. Acad. Sci., Paris **230** 1950 pp. 471-472.

244.—Devillers, C. Mécanisme de l'épibolie gastruléenne. C.R. Acad. Sci. Paris **230** 1950 pp. 2233–2234 1 text-fig.

245.—Dhar, R. P. A note on the haematological study of *Ophicephalus punctatus* Bloch. Proc. zool. Soc. Bengal **1** 1948 pp. 67–70.

246.—Dickinson, J. C. An ecological reconnaissance of the biota of some ponds and ditches in northern Florida. Quart. J. Florida Acad. **11** 2–3 1949 pp. 1–28 4 figs. 1 map.

247.—Dieuzeide, R. La faune du fond chalutable de la Baie de Castiglione. Bull. Sta. Aquic. Pêche Castiglione (N.S.) **2** 1950 pp. 9–86 6 figs.

248.—Dieuzeide, R. Sur un *Epigonus* nouveau de la Méditerranée (*Epigonus denticulatus* nov. sp.). Bull. Sta. Aquic. Pêche Castiglione (N.S.) **2** 1950 pp. 87–105 11 figs.

249.—Dieuzeide, R. Le Serran Impérial. (*Serranus atricauda* Gunther 1874) en Méditerranée. Bull. Sta. Aquic. Pêche Castiglione (N.S.) **2** 1950 pp. 157–169 3 figs.

250.—Dieuzeide, R. *Sardinella maderensis* Lowe (= *S. granigera* C. V.) sur les Côtes Nord-Africaines. Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 21–22 1 fig.

251.—Dieuzeide, R. & Champagne, R. L'Able de la Calle. (*Phoxinellus caliensis* Guichenot.) Bull. Sta. Aquic. Pêche Castiglione (N.S.) **2** 1950 pp. 171–184 7 figs.

252.—Dieuzeide, R. & Roland, J. Sur la présence de *Raia brachyura* Lafont en Méditerranée. Bull. Sta. Aquic. Pêche Castiglione (N.S.) **2** 1950 pp. 145–156 2 figs.

253.—Dijkgraaf, S. Haben die Lautausserungen der Elritze eine biologische Bedeutung? Zool. Anz. **136** 1941 pp. 103–106.

254.—Dijkgraaf, S. Über die Auslösung des Gasspuckreflexes bei Fischen. Experientia, Basel **6** 1950 pp. 189–190 1 text-fig.

255.—Dijkgraaf, S. Untersuchungen über die Funktionen des Ohrlabrynth bei Meeresfischen. Physiol. comp. oecol. Den Haag, **2** 1950 pp. 81–106 1 pl. 4 figs.

Dill, W. A. see Shapovalov, L.

Dinamani, P. see Chacko, P. I.

256.—Dobie, J. R., Meehan, O. L. and Washburn, G. N. Propagation of minnows and other bait species. Circ. U.S. Fish Wildlife Serv. No. 12, 1948 pp. 1–113 illustr.

257.—Döhrn, A. & Rein, F. H. Kreislauf-physiologische Untersuchungen an *Scyllium stellare*. Pubbl. Staz. zool. Napoli **22** 1950 pp. 106–119 2 pls. 4 text-figs. [German with English summary.]

Dollfus, R. Ph. see Bertin, L.

258.—Dottrens, E. Sur le lavaret du Lac du Bourget. Arch. Sci., Genève **3** 1950 pp. 189–202 5 figs.

259.—Dottrens, E. Le Corégone actuel du Léman. Rev. suisse zool., Genève **57** 1950 pp. 789–813 6 figs. 3 tabs.

260.—Douglas, J. A. The Carboniferous and Permian Faunas of South Iran and Iranian Baluchistan. Palaeont. indica N.S. **22** 7 1950 p. 44.

Douglas, P. A. see Evans, W. A.

261.—Drüge, H. Über die Pflege und Zucht von *Puntius partipentazona* (Fowler 1934). Wschr. Aquar. Terrarien., Braunschweig **44** 1950 pp. 3–5 1 text-fig.

262.—(Dvinin, P. A.) The migrations and morphometric characteristic of West Sakhalin *Oncorhynchus gorbusha*. C.R. Acad. Sci. Moscow N.S. **75** 1950 pp. 863–864. [In Russian.]

263.—Dyk, V. Compléments à la biologie du frai de lamproie petite de rivière. Vest. Ceskosl. zool. Spolnec. **13** 1949 pp. 41–55 3 figs. 2 pls. [French summary.]

264.—Eberl-Rothe, G. Das Pankeas von *Hemichromis bimaculatus*. Seine Veränderung im Verlaufe des Wachstums. Zool. Anz. **145** 1950 pp. 297–301 4 figs.

265.—Eckles, H. H. Observations on juvenile oceanic skipjack (*Katsuwonus pelamis*) from Hawaiian waters and Sierra mackerel (*Scomberomorus sierra*) from the Eastern Pacific. Fish. Bull. U.S. Fish Wildlife Serv. No. 48 1949 pp. 245–250 3 text-figs.

266.—Eddy, S. & Hodson, A. C. Taxonomic Keys to the common animals of the North Central States exclusive of the Parasitic Worms, Insects and Birds. Minneapolis, 1950.

267.—Eeckhoudt, J.-P. V. Recherches sur l'influence de la lumière sur le cycle sexuel de l'Épinoche, (*Gasterosteus aculeatus*). Ann. Soc. zool. Belg. **77** 1947 pp. 83–89 2 figs.

268.—Elliott, A. M. & Russert, L. R. Some population characteristics of a yellow perch population heavily parasitized by *Clinostomum marginatum*. J. Parasit., Urbana **35** 1949 pp. 183–190.

Elson, P. F. see Fisher, K. C.

269.—Elster, H.-J. & Mann, H. Zur Physiologie der Befruchtung bei Fischen. Remane and others, Verh. Deuts. Zool. in Kiel 1948, Leipzig (Gest. & Portig) 1949 pp. 136–143.

270.—Entz, B. & Woznárovich, E. Zanderzucht. Experimentelle Beiträge zur Biologie der Jungzander (*Lucioperca sandra* Cuv. et Val.) Arch. Biol. Hung. (2) **18** 1948 pp. 34–51 5 text-figs.

Erickson, D. W. see Katz, M.

271.—Eschmeyer, P. The life history of the walleye in Michigan. Bull. Inst. Fisheries Res. Michigan No. **3** 1948 pp. 1–99 1 pl. 23 text-figs.

272.—Evans, W. A. Notes on the occurrence of the bigmouth buffalo in Southern California. Calif. Fish Game **36** 1950 pp. 332–333.

273.—Evans, W. A. & Douglas, P. A. Notes on fishes recently introduced into Southern California. Calif. Fish Game **36** 1950 pp. 435–436.

274.—Everhart, W. H. The blue-back trout, *Salvelinus aquassa* (Girard), in Maine. Copeia, Ann Arbor **1950** p. 242.

275.—Fabricius, E. Heterogeneous stimulus summation in the release of spawning activities in fish. Rep. Inst. Freshwater Res. Drottningholm **31** 1950 pp. 57–99 9 figs. 3 tabs.

276.—Fabricius, E. Varför är den ena flugan bättre än den andra? Svensk. Fisk. Tidskr. **59** 1950.

277.—Fairbridge, W. S. The over-fishing of the East Australian trawl fishery. Indo-Pacific Fisheries Council Proceedings 2nd Meeting, Cronulla, N.S.W. April 1950 Bangkok (F.A.O.) 1950 pp. 73–79 1 pl. 4 figs.

278.—Fairbridge, W. S. Some populations of the Australian "Salmon," *Arripis trutta*. Indo-Pacific Fisheries

Council Proceedings, 2nd Meeting, Cronulla, N.S.W. April 1950, Bangkok, (F.A.O.) 1950 pp. 81–84 1 pl. 1 fig.

279.—Falke, H. Das Fischsterben in der Bucht von Concepcion (Mittelschile). Senckenbergiana, Frankfurt **31** 1950 pp. 57–77 5 text-figs.

280.—Faure, L. Le Sprat de la Baie de Douarnenez Pêche, Biométrie et Biologie. Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 96–102 7 figs.

281.—Fautin, R. W. Some observations on the age and growth rates of brook trout. J. Colo.-Wyo. Acad. Sci. **4** 1949 p. 66.

282.—Ferianc, O. Fauna Zvolenského okresu so zreteľom na stavovce. Prirod. Sborník, Bratislava **4** 1949 pp. 37–76 tables. [With French résumé.]

283.—Fernandez, R. & Navarro, F. de P. Observaciones sobre la sardina de Santander (Octubre de 1948 a Octubre de 1949). Bol. Inst. Esp. Oceanogr. **33** 1950 pp. 1–7 1 fig. 6 tabs.

284.—Fernandez-Yépez, A. *Anostomus ternetzi* nuevo anostomido de sur America, colectado en Palital, Estado Guarico, Venezuela. Bol. Soc. venezolana Cienc. nat. **11** 1949 pp. 293–295 figs.

285.—Fernandez-Yépez, A. Contribución al estudio de la familia Bivibranchiidae. Mem. Soc. Cienc. nat. La Salle, Caracas **9** 25 1949 pp. 353–355 6 figs.

286.—Fernandez-Yépez, A. Algunos peces del Río Autana. Noved. cient. Mus. Hist. nat. Caracas (Zool.) **2** 1950 pp. 1–18 3 pls.

287.—Fernandez-Yépez, A. A revision of the South American Characid fishes of the genus *Carnegiella*. Stanford Ichthyol. Bull. **3** 1950 pp. 169–181 6 figs. 1 map.

Field, J. see Peiss, C. N.

288.—Fisher, K. C. & Elson, P. F. The selected temperature of Atlantic salmon and speckled trout and the effect of temperature on the response to an electrical stimulus. Physiol. Zool. Chicago **23** 1950 pp. 27–34 4 text-figs.

289.—Fitch, J. E. Some new and unusual fishes from Southern California. Calif. Fish Game **34** 1948 pp. 133–135 2 figs.

290.—Fitch, J. E. Life history notes and the early development of the bonefish, *Albula vulpes* (Linnaeus). Calif. Fish Game **36** 1950 pp. 3-6 2 figs.

291.—Fitch, J. E. & Young, P. H. Use and effect of explosives in California. Calif. Fish Game **34** 1948 pp. 53-70 8 tabs. 2 figs.

292.—FitzSimons, V. A discovery of great scientific interest. African Wildlife, Johannesburg **4** 1950 p. 210. 1 text-fig.

293.—Fleury, J. Contribution à l'Etude de la Nourriture de la Sardine du Golfe de Gascogne. Rapp. Cons. Explor. Mer., Copenh. **126** 1950 pp. 53-56 3 figs.

294.—Fontaine, M. & Hatey, J. Sur la teneur en glycogène du foie de saumon (*Salmo salar* L.) adulte à diverses étapes de sa migration. C.R. Soc. Biol., Paris **144** 1950 pp. 788-789.

295.—Fontaine, M. & Hatey, J. Variations de la teneur du foie en glycogène chez le jeune saumon (*Salmo salar* L.) au cours de la "smoltification." C.R. Soc. Biol. Paris **144** 1950 pp. 953-955.

296.—Fontaine, M. & Leloup, J. Sur l'iodémie de deux téléostéens migrateurs potamotiques *Salmo salar* L. et *Alosa alosa* L. au début de leur montée reproductrice. C.R. Acad. Sci. Paris **230** 1950 pp. 775-777.

297.—Fontaine, M. & Leloup, J. L'iodémie du saumon (*Salmo salar* L.) au cours de sa migration reproductrice. C.R. Acad. Sci. Paris **230** 1950 pp. 1216-1218.

298.—Fontaine, M. & Leloup, J. L'iodémie d'un Cyclostome marin (*Petromyzon marinus* L.) au moment de sa migration reproductrice. C.R. Acad. Sci., Paris **230** 1950 pp. 1538-1539.

299.—Fontaine, M. & Leloup, J. L'iodémie du jeune saumon (*Salmo salar* L.) en eau douce. C.R. Acad. Sci., Paris **231** 1950 pp. 169-171.

300.—Fontaine, M. & Raffy, A. Le facteur hypophysaire de rétention d'eau chez les Téléostéens. C.R. Soc. Biol. Paris **144** 1950 pp. 6-7.

301.—Fontaine, M. & Vibert, R. Sur le cycle pédogénétique du Saumon. C.R. **13e** Congr. int. Zool. Paris 1948 [1949] pp. 390-392.

302.—Fontaine, M. & Vibert, R. Sur un parr de saumon hermaphrodite parvenu à maturité sexuelle. J. Conseil, Copenh. **16** 1950 pp. 216-226 3 text-figs.

303.—Fontenele, O. Contribuição para o conhecimento da biologia dos Tucunarés (Actinopterygii, Cichlidae), em cativeiro. Aparelho de reprodução. Hábitos de desova e incubação. Rev. Brazil. Biol. **10** 1950 pp. 503-519 11 figs.

304.—Ford, E. The neurocranium of the cod. Challenger Soc. London **2** 20 1948 p. 17. [Abstract.]

305.—Forest, J. Sur une anomalie de la caudale chez *Gadus luscus*. Bull. Soc. zool. Fr. **75** 1950 pp. 129-133 2 figs.

306.—Forest, J. Observations sur deux Ammodytides des côtes françaises, *Ammodytes lanceolatus* Lesauvage et *Ammodytes lancea* Cuvier. J. Conseil, Copenh. **16** 1950 pp. 179-181 3 text-figs.

307.—Forest, J. Observations sur les concentrations de Sprats des côtes françaises. Rapp. Cons. Explor. Mer., Copenh. **126** 1950 pp. 103-113 9 figs.

308.—Forest, J. & Legendre, R. De quelques Thyrsitinae (Scombridae) du genre *Nesiarchus* observés à Concarneau. Bull. Inst. océanogr. Monaco No. **966** 1950 pp. 1-12.

309.—Fowler, H. W. The fishes of Oceania—Supplement 3. Mem. Bishop Mus. Honolulu **12** 2 1949 pp. 37-186.

310.—Fowler, H. W. Os peixes de água doce do Brasil (2 entrega). Arq. zool. S. Paulo **6** 1950 pp. 205-404 447 figs.

311.—Fowler, H. W. Colombian Zoological Survey, Pt. VI. Fishes obtained at Totumo, Colombia, with descriptions of two new species. Notulae Naturae, Philad. No. **222** 1950 pp. 1-8 9 text-figs.

312.—Fowler, H. W. Some fishes from Liberia, West Africa, with descriptions of two new species. Notulae Naturae, Philad. No. **225** 1950 pp. 1-8 11 text-figs.

313.—Fowler, H. W. Results of the Catherwood-Chaplin West Indies Expedition, 1948. Part III. The fishes. Proc. Acad. nat. Sci. Philad. **102** 1950 pp. 69-93 50 figs.

Fox, D. L. see Kritzler, H.

314.—Foxon, G. E. H. A description of the coronary arteries in dipnoan fishes and some remarks on their importance from the evolutionary standpoint. *J. Anat., Lond.* **84** 1950 pp. 121-131 2 text-figs.

315.—Frade, F., Bacelar, A. & Gonçalves, B. Trabalhos da Missão Zoológica da Guiné I-V. Relatório de Missão Zoológica e contribuições para o conhecimento da fauna da Guiné Portuguesa. An. Junta Miss. Geogr. Invest. Colon. Lisboa **1** 1946 pp. 261-415 50 figs. [English summary.]

316.—Frank, P. & Allee, W. C. Ingestion of colloidal thorium dioxide by representative minnows from the Chicago region. *Physiol. Zool., Chicago* **23** 1950 pp. 134-139 pls. i and ii.

317.—Fraser, E. A. The development of the vertebrate excretory system. *Biol. Rev., Cambridge* **25** 1950 pp. 159-187 12 text-figs.

Fraser, J. C. see Curtis, B.

318.—Fraser-Brunner, A. Some problems of speciation in fishes. *Challenger Soc. London* **2** 20 1948 p. 22. [Abstract.]

319.—Fraser-Brunner, A. The fishes of the family Scombridae. *Ann. Mag. nat. Hist. (12)* **3** 1950 pp. 131-163 35 text-figs.

320.—Fraser-Brunner, A. Note on the fishes of the genus *Antigonia* (Caproidae). *Ann. Mag. nat. Hist. (12)* **3** 1950 pp. 721-724.

321.—Fraser-Brunner, A. A revision of the fishes of the family Gasteropelecidae. *Ann. Mag. nat. Hist. (12)* **3** 1950 pp. 959-970 5 text-figs.

322.—Fraser-Brunner, A. Studies in Plectognath fishes from the 'Dana' Expeditions. I. An interesting new genus of Triacanthodid fishes from the Celebes Sea. *Dana-Rep., Copenhagen* No. 35 1950 pp. 1-8 5 text-figs.

323.—Fraser-Brunner, A. *Holacanthus xanthurus*, sp. n., and other Chaetodont fishes from the Gulf of Aden. *Proc. zool. Soc. Lond.* **120** 1950 pp. 43-48 2 pls. 1 text-fig.

324.—Fraser-Brunner, A. A synopsis of the hammerhead sharks (*Sphyrna*), with description of a new species. *Rec. Austr. Mus., Sydney* **22** 1950 pp. 213-219 3 text-figs.

325.—Fredin, R. A. Fish population estimates in small ponds using the marking and recovery technique. *Iowa St. Coll. J. Sci.* **24** 1950 pp. 363-384.

326.—Freeman, J. A. Oxygen consumption, brain metabolism and respiratory movements of goldfish during temperature acclimatization, with special reference to lowered temperatures. *Biol. Bull. Woods Hole* **99** 1950 pp. 416-424 6 figs.

327.—Fridriksson, A. Herring marking in European waters. *Nature, Lond.* **165** 1950 pp. 593-594 2 text-figs.

328.—Fridriksson, A. Boreo-tended changes in the marine vertebrate fauna of Iceland during the last 25 years. *Rapp. Cons. Explor. Mer, Copenh.* **125** 1949 pp. 30-32.

329.—Fridriksson, A. & Aasen, O. The Norwegian—Icelandic herring tagging experiments. *Fiskeridir. Skrift. Havundersøk. Bergen* **9** No. 11 1950.

330.—Frost, W. E. The growth and food of young salmon (*Salmo salar*) and trout (*S. trutta*) in the River Forss, Caithness. *J. Anim. Ecol.* **19** 1950 pp. 147-158 1 fig. 11 tabs.

331.—Frost, W. E. The Eel Fisheries of the River Bann, Northern Ireland, and observations on the age of the Silver Eels. *J. Conseil, Copenh.* **16** 1950 pp. 358-383 10 figs. 5 tabs. 1 pl.

332.—Fujita, T., Uno, K., Yatsunagi, K. & Kubota, Z. On artificial taking-eggs of loach by injection of pituitary hormone. *Contr. Central Fish. Stat. Japan* No. 44 1948 pp. 254-258.

333.—Furnestin, J. Observations sur le sprat (*Clupea sprattus* Linné) des côtes meridionales de France (Atlantique et Méditerranée). *Rev. Trav. Pêches marit. Paris* **14** 1948 pp. 39-69 3 text-figs.

334.—Furnestin, J. Etude comparative de quelques caractères métriques des Sardines du Golfe de Gascogne et du Maroc. *Rapp. Cons. Explor. Mer, Copenh.* **126** 1950 pp. 37-42 10 figs.

335.—Furnestin, J. Premières observations sur la biologie de la Sardine Marocaine. *Rapp. Cons. Explor. Mer, Copenh.* **126** 1950 pp. 57-61.

336.—Furnestin, J. Les races de Sardines du Déroit de Gilbratar et de ses Abords. *Rapp. Cons. Explor. Mer, Copenh.* **126** 1950 pp. 62-67 3 figs.

337.—Furnestin, J. & Coupe, R. Les caractéristiques morphologiques des Anchois (*Engraulis encrasicolus* Linn.) du Maroc. J. Conseil, Copenh. **16** 1950 pp. 182-184.

338.—Gallien, L. Analyse des facteurs endocriniens et génétiques contrôlant le pheno-type sexuel somatique chez *Lebistes reticulatus* Regan. C.R. **13e** Congr. int. Zool., Paris 1948 [1949] pp. 168-169.

339.—Ganapati, S. V. & Alikunhi, K. H. Experiments on the acclimatisation of saltwater fish seed to freshwater. Proc. Indian Sci. Congr. **36th** 3 1949 p. 161. [Abstract.]

340.—Ganapati, S. V. & Alikunhi, K. H. Factory effluents from the Mettur Chemical and Industrial Corporation Ltd, Mettur Dam, and their effects on the fisheries of the river Cauvery. Proc. Indian Sci. Congr. **36th** 3 1949 pp. 161-162. [Abstract.]

341.—Ganapati, S. V. & Alikunhi, K. H. Hydrobiological notes of the river Cauvery at selected fishing centres in the Madras Presidency. Proc. Indian Sci. Congr. **36th** 3 1949 p. 162. [Abstract.]

342.—Ganapati, S. V. & Alikunhi, K. H. Note on the spawning of Carps in the River Tungabhadra in response to off-season freshets. J. zool. Soc. India **2** 1950 pp. 93-95.

343.—Ganapati, S. V. & Alikunhi, K. H. Factory effluents from the Mettur Chemical and Industrial Corporation Ltd., Mettur Dam, Madras, and their pollutional effects on the fisheries of the River Cauvery. Proc. nat. Inst. Sci. India **16** 1950 pp. 189-201 tables.

344.—Ganapati, S. V. & others. On a peculiar case of fish mortality in a section of the Fort Moat fish farm, Vellore. J. zool. Soc. India **2** 1950 pp. 97-100.

Ganapati, S. V. see Alikunhi, K. H.

Ganapati, S. V. see Chacko, P. I.

Ganguly, D. N. see Mookerjee, H. K.

345.—Garnaud, J. La reproduction et l'incubation branchiale chez *Apogon imberbis* G. et L. Bull. Inst. océanogr. Monaco No. 977 1950 pp. 1-10 2 pls. 5 figs.

346.—Garnaud, J. Notes partielles sur la reproduction d'*Apogon imberbis*. Terre et la Vie, Paris **97** 1950 pp. 39-42 2 figs.

347.—Garven, H. S. D. On the size of the liver and spleen in the various classes of vertebrates. Peking nat. Hist. Bull. **16** 1948 pp. 175-177 tables.

348.—Geldiay, R. Etude comparée sur les formes macroscopique et microscopique du barrage de tchoubouk et du lac d'Emir (voisinage d'Ankara). Commun. Fac. Sci. Univ. Ankara **2** 1949 pp. 151-199 23 pls. 25 figs. tables.

George, P. C. see Bhimachar, B. S.

349.—Gerbilski, N. L. Biological groups of *Acipenser güldenstädti persicus* Borodin and the principles of their industrial use. C.R. Acad. Sci. Moscow N.S. **71** 1950 pp. 785-788. [In Russian.]

350.—Gerlach, J. Beiträge zur vergleichenden Morphologie des Selachierhines. Anat. Anz., Jena **96** 1947 pp. 79-165 38 figs.

351.—Getman, H. C. Adaptive changes in the chloride cells of *Anguilla rostrata*. Biol. Bull. Woods Hole **99** 1950 pp. 439-445 6 figs.

352.—Geyer, F. & Mann, H. Die Atmung des Ungarischen Hundfisches (*Umbra lacustris* Grossinger). Zool. Anz. **127** 1939 pp. 234-245 2 figs.

353.—Geyer, F. & Mann, H. Beiträge zur Atmung der Fische II. Weiteres zur Atmung des Ungarischen Handsfisches (*Umbra lacustris* Grossinger). Zool. Anz. **127** 1939 pp. 305-312 1 fig.

Ghosh, S. see Kar, A. B.

354.—Gibson-Hill, C. A. The fishing boats operated from Singapore Island. J. Malayan Br. Asiatic Soc. **23** 3 1950 pp. 148-170 2 pls. 8 figs.

355.—Gilis, Ch. Les concentrations de Sprats sur la Côte Belge. Leur exploitation et étude biologique. Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 114-121 12 tabs. 4 figs.

356.—Ginsburg, I. Review of the western Atlantic Triglidae (fishes). Texas J. Sci. **2** 1950 pp. 489-527 tables.

Ginzburg, A. C. see Detlaf, T. A.

Giovannoli, L. see Carr, A. F.

- 357.—Glegg, W. E. Introduction of wels or catfish into Hertfordshire. Trans. Herts. nat. Hist. Soc. **33** 1950 p. 131.
- 358.—Gneri, F. S. El estudio de las migraciones de los peces y su importancia en la explotación pesquera. 1st Congr. nac. Pesq. Mar. d. Plata **2** 1950 pp. 79–95 3 figs.
- 359.—Godsil, H. C. & Holmberg, E. K. A comparison of the blue-fin tunas, genus *Thunnus* from New England, Australia and California. Fish. Bull., Calif. No. 77 1950 pp. 1–55 15 text-figs.
- Goncalves, B. see Frade, F.
- 360.—Goodrich, H. B., Hine, R. L. & Reynolds, J. Studies on the terminal phases of color pattern formation in certain coral reef fish. J. exp. Zool. **114** 1950 pp. 603–625 8 figs. 4 tabs.
- 361.—Goodwin, T. W. Carotenoids and reproduction. Biol. Rev., Cambridge **25** 1950 pp. 391–413.
- 362.—Gopinath, K. The Malayan purse seine (pukat jerut) fishery. J. Malayan Br. Asiat. Soc. **23** 3 1950 pp. 75–96 12 figs.
- 363.—Gopinath, K. Freshwater Fish-Farming in the Malay Archipelago. J. zool. Soc. India **2** 1950 pp. 101–108 2 figs. 1 map.
- 364.—Gordon, H. & M. Colour patterns and gene frequencies in natural populations of a platyfish. Heredity, Lond. **4** 1950 pp. 61–73 1 text-fig.
- 365.—Gordon, M. Heredity of pigmented tumours in fish. Endeavour, Lond. **9** 33 1950 pp. 26–34 2 pls. 5 text-figs.
- 366.—Gorizdro-Kulczycka, Z. Dwudyszne eyby dewońskie Gór Świętokrzyskich (Les Dipneustes devoniens du Massif de Ste Croix). Acta geol. polon., Warszawa **1** pp. 53–105 1950 2 text-figs. pls. 1–4. (French transl. p. 82.)
- 367.—Gosline, W. A. The osteology and relationships of the echelid eel, *Kaupichthys diodontus*. Pacific Sci., Honolulu **4** 1950 pp. 309–314 7 figs.
- Green, A. S. see Schultz, L. P.
- 368.—Gregory, J. T. A large Pycnodont from the Niobrara Chalk. Postilla, Yale Peabody Mus. Nat. Hist. **5** 1950 pp. 1–10 2 text-figs.
- 369.—Grinberg, M. M. Relation of the scale size in Teleostei to the shape of the body and the kind of motion. Zool. Journ. Moscow **29** 1950 pp. 449–458. [In Russian.]
- 370.—Grodzinski, Z. The susceptibility of the heart in sea-trout embryos *Salmo trutta* L. to small changes of temperature. C.R. Sci. math. nat. Acad. Polon. **1950** 4–5 p. 17. [Abstract.]
- 371.—Gross, F. Experiments in marine fish cultivation. C.R. **13e** Congr. int. Zool., Paris 1948 [1949] pp. 392–393.
- 372.—Gross, F. A fish cultivation experiment in an arm of a sea-loch. I. Introduction. Proc. roy. Soc. Edinb. **64B** 1950 pp. 1–4.
- 373.—Gross, F. A fish cultivation experiment in an arm of a sea-loch. V. Fish growth in Kyle Scotnish. Proc. roy. Soc. Edinb. **64B** 1950 pp. 109–135 4 text-figs.
- 374.—Gross, W. Die paläontologische und stratigraphische Bedeutung der Wirbeltierfaunen des old Reds und der marinen altpaläozoischen Schichten. Abh. deutsch. Akad. Wiss. Berlin, math-naturw. Kl. **1949** 1 1950 130 pp. 1 text-fig.
- 375.—Gross, W. Umbenennung von *Aldingeria* Gross (Palaeoniscidae Oberdevon) in *Moythomasia* n. nom. N. Jahrb. Geol. Paläont., Stuttgart **5** 1950 p. 145.
- 376.—Grosso, L. L. The effect of alloxan on the pancreas, liver, and kidney of the Teleost, *Lebistes reticulatus*, with notes on the normal pancreas. Zoologica, N.Y. **35** 1950 pp. 169–180 4 pls.
- 377.—Gudger, E. W. Catching fishes with the hand. I. In the two Americas: 1699–1942. Amer. Nat. **82** 1948 pp. 281–288.
- 378.—Gudger, E. W. Fishes in water pipes. Amer. Midl. Nat. **43** 1950 pp. 399–409 2 text-figs.
- 379.—Gudger, E. W. A boy attacked by a shark, July 25, 1936 in Buzzard's Bay, Massachusetts. With notes on attacks by another shark along the New Jersey coast in 1916. Amer. Midl. Nat. **44** 1950 pp. 714–719 2 figs.

- 380.—Gudger, E. W.** Fishing with the hand. "Tickling trout" and other fishes in Great Britain; 1602–1943. *Aust. Mus. Mag. Sydney* **10** 1950 pp. 61–64 1 fig.
- 381.—Gudger, E. W.** A second record of the whale shark, *Rhineodon typus*, in Panama Bay. *Calif. Fish Game* **36** 1950 pp. 313–315 1 text-fig.
- 382.—Gudger, E. W.** The history and discovery (1600–1680) of the spiral valve in the large intestine of Elasmobranchs and a ganoid. *J. Elisha Mitchell sci. Soc. Chapel Hill* **66** 1950 pp. 53–69 9 text-figs.
- 383.—Gudger, E. W.** Fish that live as Inquilines (Lodgers) in sponges. *Zoologica, N.Y.* **35** 1950 pp. 121–126 2 figs.
- 384.—Guiglia, D.** Il *Tetragonurus cuvieri* Risso, 1810 nel Golfo di Genova. *Ann. Mus. Civ. Stor. Nat. Genova* **64** 1950 pp. 158–169.
- 385.—Guiglia, D.** Nuova cattura di *Regalicus glesne* Asc. nel Golfo di Genova. *Ann. Mus. Civ. Stor. nat. Genova* **64** 1950 pp. 288–290.
- 386.—Guiler, E. R.** Breeding female of the Pipefish. *Nature, Lond.* **166** 1950 p. 958.
- 387.—Gunter, G.** Correlation between temperature of water and size of marine fishes on the Atlantic and Gulf Coasts of the United States. *Copeia* **1950** pp. 298–304 1 tab.
- 388.—Güntert, H.** Beschreibung einiger zum Teil noch unbekannter südamerikanischer Siluriden aus dem Naturhistorischen Museum in Basel. *Zool. Anz.* **138** 1942 pp. 27–40 7 figs.
- 389.—Gustafson, K. J.** Movements and growth of grayling. *Rep. Inst. Freshwater Res. Drottningholm* **29** 1949 pp. 35–44 5 text-figs.
- Guzeva, M. I.** see Vernidub, M. F.
- 390.—Hagmeier, A. & Künne, C.** Die Nahrung der Meerestiere. Lübbert & others. *Handb. Seefisch. Nordeurop., Stuttgart* **1** Hft. 5a. 1950 pp. 1–85 11 pls. 65 figs.
- 391.—Halme, E.** Die Abwasserfrage der Zellstoffwerke im Lichte einiger fischtoxischologischen Versuche. *Ann. zool. Soc. zool. bot. fenn. Vanamo Helsinki* **13** No. 7 1950 pp. 1–118 59 text-figs.
- 392.—Halstead, B. W.** The capture of a wattled eel-pout, *Lycodes palearis*, from Fidalgo Island, Washington, and the distributional record of this species. *Copeia*, **1950** p. 317.
- 393.—Halstead, B. W. & Modglin, F. R.** A preliminary report on the venom apparatus of the bat-ray, *Holorhinus californicus*. *Copeia* **1950** pp. 165–175 6 figs. 1 tab.
- 394.—Hamai, I.** A study of the growth of the fish, *Cyprinus carpio* L. *Sci. Rep. Tōhoku Univ. (4) Biol.* **16** 1941 pp. 17–89 13 figs. tables.
- 395.—Hamm, W. S.** Liver oil properties of Philippine sharks and rays. *Res. Rep. U.S. Fish Wildlife Serv. No. 23* 1950 pp. 1–5.
- 396.—Hance, W. A.** Outer Hebrides in relation to Highland depopulation, N.Y. 1949 pp. 89–112.
- Handley, J.** see Wales, J. H.
- Handwerk, P. S.** see Lachner, E. A.
- 397.—Haneda, Y.** *Harpodon nehereus*, a non-luminous fish. *Pacific Sci. Honolulu* **4** 1950 pp. 135–138.
- 398.—Haneda, Y.** Luminous organs of fish which emit light indirectly. *Pacific Sci. Honolulu* **4** 1950 pp. 214–227 6 figs.
- 399.—Hansen, P.** Age—Analyses. *Ann. Biol., Copenh.* **6** 1949 [1950] pp. 42–44.
- 400.—Hardenberg, J. D. F.** Development of pelagic fisheries. *Proc. Indo-Pacific Fisheries Council Singapore* 1949 (1950) pp. 138–143.
- 401.—Hardy, E.** The "Australian Salmon." *Salmon Trout Mag. Lond.* No. 128 1950 pp. 62–66.
- 402.—Hardy, G. A.** A report on a study of Jordan Meadows, Vancouver Island. *Rep. Prov. Mus. Victoria, B.C.* **1948** 1949 pp. 20–46 8 text-figs.
- 403.—Harmon, R. W. & Pollard, C. B.** Bibliography of animal venoms. Gainesville, Florida 1948 340 pp.
- 404.—Harrington, R. W.** Preseasonal breeding by the Bridled Shiner, *Notropis bifrenatus*, induced under light-temperature control. *Copeia* **1950** pp. 304–311 1 fig.

- 405.—Harris, J. E. The function of fins in fishes. Challenger Soc., London 2 19 1947 p. 16. [Abstract.]
- 406.—Harris, J. P. Fusion of internal carotid arteries in the dogfish, *Squalus acanthias*. Field & Lab., Dallas 17 1949 p. 115.
- 407.—Harrison, H. M. Use by fish of the modified denil fishway in the Des Moines River. Proc. Iowa Acad. Sci. 55 1948 pp. 367-373 tables.
- 408.—Harrison, H. M. An annotated list of the fishes of the Upper Des Moines River basin in Iowa. Proc. Iowa Acad. Sci. 56 [1950] pp. 333-342 1 fig.
- 409.—Harry, R. R. A new parrot fish of the genus *Xenoscarus* from the Gulf of California.. Amer. midl. Nat. 43 1950 pp. 146-151 3 text-figs.
- 410.—Hart, T. J. A note on growth zones in bones of *Phycis blennoides* Brünn. J. Conseil, Copenh. 16 1950 pp. 335-340 1 tab.
- Hashimoto, J. see Migita, M.
- 411.—Haskins, C. P. & E. F. The role of sexual selection as an isolating mechanism in three species of poeciliid fishes. Evolution, Lancaster, Pa. 3 1949 pp. 160-169.
- 412.—Hass, H. In the mouth of the Devil's Ray. Illustrated, Lond. July 22nd 1950 pp. 22-24 5 photos.
- 413.—Hatey, J. Action de la thiourée sur le métabolisme glucidique de la carpe (*Cyprinus carpio* L.) C.R. Soc. Biol. Paris 144 1950 pp. 955-957.
- Hatey, J. see Fontaine, M.
- 414.—Havinga, B. The Anchovy in the Dutch Waters after the enclosure of the Zuidersea. Rapp. Cons. Explor. Mer, Copenh. 126 1950 pp. 123-125 2 tabs.
- 415.—Hayes, F. R. The growth, general chemistry, and temperature relations of salmonid eggs. Quart. Rev. Biol., Baltimore 24 1949 pp. 281-308 19 text-figs.
- 416.—Heller, H. The comparative physiology of the neurohypophysis. Experientia, Basel 6 1950 pp. 368-376.
- 417.—Henschel, J. Neue Untersuchungen über den Atemmechanismus mariner Teleostee. Helgol. wiss. Meeresuntersuch 2 1941 pp. 244-278 12 figs. 8 tabs.
- Henschel, J. see Marx, W.
- 418.—Hentschel, E. Eine biologische Karte des Atlantischen Ozeans. Zool. Anz. 137 1942 pp. 103-123 1 fig.
- 419.—Hentschel, E. Planktonkunde und Fischereibiologie. Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart (N.F.) 11 1948 pp. 258-281.
- 420.—Herald, E. S. *Ichthyocampus pawneeii*, a new pipefish from the Bahamas. J. Wash. Acad. Sci. 40 8 1950 p. 269.
- 421.—Herald, E. S. & Strickland, R. R. An annotated list of the fishes of Homosassa Springs, Florida. Quart. J. Florida Acad. Sci. 11 1950 pp. 99-109.
- Herman, E. F. see Mackenthun, K. M.
- 422.—Herre, A. W. C. T. A new labrid and other interesting Philippine fish records. Philipp. J. Sci., Manila 78 1949 pp. 149-153.
- 423.—Herre, A. W. A new name for *Hanno*, a genus of African gobies. Stanford Ichthyol. Bull. 3 1950 p. 198.
- 424.—Herter, K. Von den Wirbeltieren in und um Berlin. Berlin, 1947.
- 425.—Herter, K. Über simultanen Farbencontract bei Fischen. Biol. Zbl., Leipzig 69 1950 pp. 283-300 4 figs. tables.
- 426.—Hervey, G. The goldfish of China in the XVIII century. London (The China Society) 1950, pp. 66 frontis. 2 figs.
- 427.—Hess, L. The Strange Courtship of the Sea Horse. Illust. Lond. News 216 1950 pp. 138-9 5 figs.
- 428.—Hesse, R. Tierbau u. Tierleben. Bd. 2 Jena 1943.
- 429.—Higashi, H., Masuda, S. & Iseki, P. Studies on the utilization of liver oils of deep-sea sharks. I. Contr. Central Fish. Stat. Japan No. 14 1948 pp. 45-47. [English summary.]
- 430.—Higginbotham, A. C. Notes on the oxygen consumption and activity of catfish. Ecology, Brooklyn 28 1947 pp. 462-464 2 text-figs.
- 431.—Higginbotham, A. C. & Meyer, D. K. Determination of the physical condition of fish. I. Some blood analyses of the southern channel catfish. Quart. J. Florida Acad. Sci. 11 1950 pp. 119-124.

432.—Higgins, E. Samuel F. Hildebrand as a government scientist. *Copeia* 1950 pp. 8–11.

Hine, R. *see* Goodrich, H. B.

433.—Hoar, W. S. & Bell, G. M. The thyroid gland in relation to the seaward migration of Pacific salmon. *Canad. J. Res.* 28D 1950 pp. 126–136 2 pls. 3 text-figs.

Hoar, W. S. *see* Bell, G. M.

434.—Hobbs, D. F. Migrating eels in Lake Ellesmere. *Trans. Roy. Soc. N.Z.* 77 5 1949 pp. 228–232.

435.—Hodgson, W. C. Echo-Sounding and the Pelagic Fisheries. *Fish. Invest.*, Lond. (2) 17 4 1950 pp. 1–25 24 figs.

436.—Hodgson, W. G. & Richardson, I. D. The experiments on the Cornish Pilchard Fishery in 1947–8. *Fish. Invest.* Lond. (2) 17 2 1949 pp. 1–21 10 pls. 7 figs.

Hodson, A. C. *see* Eddy, S.

437.—Hoedeman, J. J. Rediagnosis of the Characid-Nannostomine fish genera *Nannostomus* and *Poecilibrycon*. *Amsterdam Nat.* 1 1950 pp. 11–27 2 pls. 5 text-figs.

438.—Hoedeman, J. J. A new Characid-Erythrinine fish (*Pseuderythrinus rosapinnis* gen. et sp. nov.) *Amsterdam Nat.* 1 1950 pp. 79–91 5 figs. tables.

439.—Hofer, H. Zur Kenntnis der Suspensionsformen des Kieferbogens und deren Zusammenhänge mit dem Bau des Knöchernen Gaumens und mit der Kinetik des Schädels bei den Knochenfischen. *Zool. Jahrb. (Anat.)* 69 1945 pp. 321–404 21 text-figs.

440.—Hofstede, A. E. & Ardiwinata, R. O. Compiling statistical data on fish culture in irrigated rice fields in West Java. *Landbouw, Djakarta* 22 1950 pp. 469–494.

441.—Hofstede, A. E. & Botke, F. *Tilapia mossambica* Peters as a factor in malaria control in the vicinity of Djakarta. *Landbouw, Djakarta* 22 1950 pp. 453–468.

442.—Holgersen, H. Storøyet Havkaruss, *Box boops* L., ny for Norges fauna. *Stavanger Mus. Årbok* 1949 1950 pp. 85–86 1 text-fig. [Norwegian with English summary.]

443.—Holgersen, H. Fisker fra sørlige farvann. *Stavanger Mus. Årbok* 1949 1950 pp. 87–92 2 text-figs. [Norwegian with English summary.]

444.—Holly, M. Zur Nomenklatur von *Umbra krameri*, Walbaum 1792. *Zool. Anz.* 133 1941 pp. 95–96.

Holmberg, E. K. *see* Godsil, H. C.

445.—Holmgren, N. On the ontogenetical development of the sensory lines on the cheek in fishes and amphibians. *C.R. 13e Congr. int. Zool.*, Paris 1948 [1949] pp. 289–290.

446.—Holmgren, L. On the pronephros and the blood in *Myxine glutinosa*. *Acta zool. Stockh.* 31 1950 pp. 233–348 75 figs. 2 tabs.

447.—Holst, E. von. Die Tätigkeit des Statolithenapparats im Wirbeltierlabyrinth. *Naturwissenschaften*, Berlin 37 1950 pp. 265–272 14 text-figs.

448.—Holst, E. von. Quantitative Messung von Stimmungen im Verhalten der Fische. *Symposia Soc. exp. Biol.*, Cambridge No. 4 1950 pp. 143–172 1 pl. 16 text-figs.

449.—Hora, S. L. Himalayan glaciation and its effects on terrestrial and freshwater animal life in Peninsular India. *Bijdr. Dierk.* 28 1949 pp. 193–204.

450.—Hora, S. L. Systematic position of Siluroids in Hamilton's "Gangetic fishes." *Rec. Indian Mus., Calcutta* 46 1949 pp. 63–72 pl. II.

451.—Hora, S. L. Catching fishes with the hand in India. *Science* 111 1950 pp. 263–264.

452.—Hora, S. L. & Menon, M. A. S. Systematic position of three Glyptosternoid fishes described by Hamilton. *Rec. Indian Mus., Calcutta* 46 1949 pp. 55–61.

453.—Hoshina, T. A case of fibroplastic sarcoma developed in *Hypomesus olidus* (Pallas). *Jap. J. Ichthyol.* Tokyo 1 1950 pp. 53–56 2 text-figs. [Japanese with English summary.]

454.—Hrabě, S. The food of carp in its earliest age. *Sborn. Kl. přír. Brno* 26 1946 pp. 30–38. [Czecho-slovak with English summary.]

455.—Hubbs, C. L. Samuel F. Hildebrand, Ichthyologist and Herpetologist. *Copeia* 1950 pp. 12–14.

456.—Hubbs, C. L. Studies of Cypriodont Fishes. XX. A new subfamily from Guatemala, with ctenoid scales and a unilateral pectoral clasper. Misc. Publ. Mus. Zool. Univ. Mich. No. 78 1950 pp. 1-28 4 pls.

457.—Hubbs, C. L. On the supposed, occurrence in New Zealand of the North Pacific fish genus *Sebastodes*. Pacific Sci., Honolulu 4 1 1950 p. 70.

458.—Hubbs, C. L. & McHugh, J. L. Pacific sharpnose shark (*Scoliodon longurio*) in California and Baja California. Calif. Fish Game 36 1950 pp. 7-11 2 figs. 1 tab.

459.—Hubbs, C. L. & Miller, R. R. The Great Basin with emphasis on glacial and postglacial times. II. The zoological evidence. Correlation between fish distribution and hydrographic history in the desert basins of Western United States. Contr. Scripps Inst. Oceanogr. 1948 1949 No. 369 pp. 17-166 19 text-figs.

460.—Hubbs, C. L. & Wallis, O. L. The native fish fauna of Yosemite National Park and its preservation. Yosemite Nat. Notes 27 12 1948 pp. 131-144 3 text-figs. (See Contr. Scripps Inst. Oceanogr. 1948 1949 No. 394.)

Hubbs, C. L. see Kritzler, H.

461.—Hueske, E. E. Three Piedmont reservoirs. J. Elisha Mitchell sci. Soc., Chapel Hill 65 1949 pp. 203-204. [Abstract.]

462.—Huet, M. Note préliminaire sur les relations entre la pente et les populations piscicoles des eaux courantes. Biol. Jaarb. Antwerpen 13 1946 pp. 232-243.

463.—Huet, M. Les effets de l'introduction des poissons exotiques. Proc. & Pap. Internat. tech. Conf. Protect. Nature, Paris 1949 1950 pp. 419-420.

464.—Hult, J. & Johnels, A. Predators on salmon fry in the river Mörrumså " in 1948. Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 45-48.

465.—Huntsman, A. G. Method in ecology — biapocrisis. Ecology, Brooklyn 29 1948 pp. 30-42.

466.—Huntsman, A. G. Factors which may affect migration. Salmon & Trout Mag. No. 130 1950 pp. 227-239.

467.—Hynes, H. B. N. The food of freshwater sticklebacks (*Gasterosteus aculeatus* and *Pygosteus pungitius*), with a review of methods used in studies of the food of fishes. J. Animal Ecol. 19 1950 pp. 36-58 1 fig.

Hynes, H. B. N. see Jones, J. W.

468.—Inger, R. F. What and how fishes can hear, as revealed in tests. Bull. Chicago nat. Hist. Mus. 21 1950 5 pp. 4-5 2 text-figs.

469.—Innes, W. T. Importations. Aquarium, Philad. 19 1950 p. 197.

470.—Irikhimovitch, A. I. Influence of sea-water on the growth and life capacity of young Acipenseridae. C.R. Acad. Sci. Moscow N.S. 73 1950 pp. 617-620 fig. [In Russian.]

471.—Irikhimovitch, A. I. Study of the phases in accumulation and secretion of the thyroid gland hormone in young Acipenseridae. C.R. Acad. Sci. Moscow N.S. 73 1950 pp. 857-860 figs. [In Russian.]

Iseki, P. see Higashi, H.

472.—Iselstöger, H. Einige Gedanken über die Beziehungen zwischen Form und Funktion des Bogengangsapparats des Häutigen Labyrinths der Wirbeltiere. Biol. generalis, Wien 16 1943 pp. 500-512 5 text-figs.

473.—Iselstöger, H. Das Labyrinth von *Pristiophorus japonicus* Günther. Gegenbaurs Jb. 86 1941 pp. 259-286 8 figs.

474.—Iselstöger, H. Das Labyrinth von *Rhinobatus columnae*, Bonap. Gegenbaurs Jb. 89 1943 pp. 73-97 11 figs.

475.—Iselstöger, H. Ein Beitrag zur Kenntnis der Lebensweise von *Rhina squatina*. Verh. zool.-bot. Ges. Wien 90-91 1944 pp. 77-82.

476.—Ishiyama, R. Studies on the rays and skates belonging to the Family Rajidae, found in Japan and adjacent regions. Jap. J. Ichthyol. Tokyo 1 1950 pp. 30-36 2 text-figs. [Japanese with English summary.]

477.—Ito, S. Notes on the sardine (*Sardinia melanosticta*) taken in Suruga Bay during the period from September, 1946 to August, 1947. Contr. Central Fish. Stat. Japan No. 73 1948 pp. 177-180 figs.

478.—**Jackson, R. I.** Variations in flow patterns at Hell's Gate and their relationships to the migration of sock-eye salmon. Bull. int. Pacific Salmon Fish Comm. No. 3 1950 pp. 85-129 19 text-figs.

479.—**Jacobs, D. L.** Oodinium. Aquarium, Philad. 19 1950 pp. 256-259 text-figs.

480.—**Jančařík, A.** Contribution to the physiology of the digestion of the carp: the digestion of proteids. Acta Univ. Agric. Silvicult. Brno No. D41 1949 pp. 1-60 18 text-figs. [English summary.]

481.—**Jansen, J. F.** Summary of recovery of California Sardine tags on the Pacific Coast. Calif. Fish Game 34 1948 pp. 3-10 6 tabs.

482.—**Järvi, T. H.** Die Kleinmaränenbestände in ihren Beziehungen zu der Umwelt (*Coregonus albula* L.) Acta zool. fenn. 61 1950 pp. 1-116 18 pls. 18 mps. 13 tabs.

483.—**Jarvik, E.** On some osteolepiform Crossopterygians from the Upper Old Red Sandstone of Scotland. K. Svensk. Vetensk. Akad. Handl. (4) 2 2 1950 35 pp. 10 text-figs. 10 pls.

484.—**Jarvik, E.** Note on Middle Devonian Crossopterygians from the Eastern part of Gauss Halvö, East Greenland. Medd. Grønland 149 6 1949 20 pp. 3 text-figs. 2 pls.

485.—**Jarvik, E.** Middle Devonian Vertebrates from Canning Land and Wegeners Halvö (East Greenland). II. Crossopterygii. Medd. Grønland 96 4 1950 pp. 1-132, 37 text-figs. 24 pls.

486.—**Jean, J.** Un poisson nouveau pour la faune de notre région. Bull. Soc. Étud. Sci. nat. Nîmes 47 [1936] pp. 127-128.

487.—**Jensen, A. J. C.** Changes in the quality of the herring in the course of the year and from year to year. Rep. Danish biol. Sta. No. 51 1950 pp. 3-17 4 figs. tables.

488.—**Jensen, A. J. C.** Amount and growth of herring fry in the Danish waters. Rep. Danish biol. Sta. No. 51 1950 pp. 19-48 12 figs. tables.

Jensen, A. J. C. see Christiansen, M.

489.—**Jensen, A. S.** Om nogle for den Danske fauna nye eller sjældre Fiskearter. Vidensk. Medd. Dansk.

naturh. Foren. 104 1940 pp. 179-206 1 map.

490.—**Jensen, A. S.** On some deep-sea fishes caught by the Danish Godthaab Expedition 1928 not previously known from West Greenland. Vidensk. Medd. Dansk. naturh. Foren. 112 1950 pp. 243-248 3 figs.

491.—**Jensen, A. S.** On a period with an abundance of fish in West Greenland about the beginning of the last century. Vidensk. Medd. Dansk. naturh. Foren. 112 1950 pp. 249-251.

492.—**Jensen, I. B.** Biological investigations on the smelt (*Osmerus eperlanus* L.) Vidensk. Medd. Dansk. naturh. Foren. 111 1949 pp. 73-109 1 map, 1 table.

493.—**Johanson, A.** The White-Fish population of Lake Ocke. Rep. Inst. Freshwater Res. Drottningholm 31 1950 pp. 100-109 2 figs. 1 tab.

Johnels, A. see Hult, J.

494.—**Johnels, A. G.** On the dermal connective tissue of the head of *Petromyzon*. Acta zool. Stockh. 31 1950 pp. 177-185 6 figs.

Johnson, H. E. see Rucker, R. R.

495.—**Johnson, R. S.** Morecambe Bay Salmon. Field 195 1950 p. 120-121 5 figs.

496.—**Jones, J. W.** Studies of the scales of young salmon, *Salmo salar* L. (juv.) in relation to growth, migration, and spawning. Fish. Invest. Lond. (1) 5 1 1949 pp. 1-23 16 tabs.

497.—**Jones, J. W.** Salmon of the Cheshire Dee. Fish. Invest., Lond. (1) 5 2 1950 pp. 1-20 1 fig. 16 tabs.

498.—**Jones, J. W. & Hynes, H. B. N.** The age and growth of *Gasterosteus aculeatus*, *Pygosteus pungitius* and *Spinachia vulgaris*, as shown by their otoliths. J. Animal Ecol. 19 1950 pp. 59-73 3 figs.

499.—**Jones, J. W. & King, G. M.** Further experimental observations on the spawning behaviour of the Atlantic Salmon (*Salmo salar* Linn.) Proc. zool. Soc. Lond. 120 1950 pp. 317-323 1 pl.

500.—**Jones, J. W. & King, G. M.** Progeny of male salmon parr. Salmon Trout Mag., Lond. 128 1950 pp. 24-26.

501.—Jones, S. A note on the terminology of the early developmental stages of fishes. *J. zool. Soc. India* 2 1950 pp. 39-41.

502.—Jones, S. Bibliography of breeding habits and development of fishes of inland waters of India. *J. zool. Soc. India* 2 1950 pp. 109-125.

503.—Jones, S. & Menon, P. M. G. Spawning habits and development of the gangetic anchovy, *Setipinna phasa* (Hamilton). *Current Sci. Bangalore* 19 1950 p. 25.

504.—Jones, S. & Menon, P. M. G. Spawning of *Hilsa ilisha* (Hamilton) in the Hooghly river. *Sci. & Culture, Calcutta* 15 1950 pp. 443-444.

505.—Jonet, S. Quelques poissons nouveaux de l'Oligocène de Roumanie. *Bull. Soc. belge géol. Pal. Hydr.* 58 1949 pp. 159-162.

506.—Jonet, S. *Amphisile teleajensis*, nouvelle espèce de Téléostéen oligocène des Carpathes roumaines. *Bull. Soc. belge Géol. Pal. Hydr.* 58 1950 pp. 360-367.

507.—Jonet, S. La faune paléoméditerranéenne et la présence du genre *Bregmaceros* dans l'Oligocène de Roumanie. *Bull. Soc. Géol. Belg.* 73 1950 pp. B94-97.

508.—Jullien, A., Laurent, P. & Ripplinger, J. Sur la teneur des principaux organes en acétycholine chez les poissons d'eau douce. *Bull. Soc. Hist. nat. Doubs* No. 53 1950 pp. 15-17 1 table.

509.—Jullien, A. & Ripplinger, J. L'acétylcholine chez quelques poissons marins. Ses variations par l'emploi des anticholinesterases. *Ann. Scient. Franche-Comté, Besançon* 4 *Zool.* 1949 pp. 17-23.

510.—Jullien, J. & Ripplinger, J. Le rameau cardiaque du pneumogastrique des poissons, est formé d'au moins deux nerfs : un nerf chronotrope, cholinergique, et un nerf tonotrope, non cholinergique. *C.R. Acad. Sci. Paris* 230 1950 pp. 867-868.

511.—Juszczyk, W. The migration of fish through the Rożnów dam fish-ladder (Dunajec river). *Bull. int. Acad. Cracovie* 1949 B II 1950 pp. 303-336 2 pls.

512.—Juszczyk, W. The number of eggs which remain in the gastric cavity of the female of the sea-trout (*Salmo trutta* L.) of the rainbow trout (*Salmo irideus* Gibb.) and the cross between the trout (*Salmo trutta m. fario* L.) and the sea-trout (*Salmo trutta* L.) after the artificial squeezing out of the eggs. *C.R. Sci. math. nat. Acad. polon.* 1950 1-3 pp. 11-12. [Abstract.]

513.—Kähsbauer, P. Beitrag zur Systematik der Syngnathiden (Pisces). *Ann. Nat. hist. Mus. Wien* 57 1949-50 pp. 263-272.

Kaiser, E. W. *see* Bruun, A. F.

514.—Kaj, J. Contribution to the knowledge of *Pygosteus pungitius* L. in Poland. *Prace Kom. mat.-prz. Tow. Przyj. Nauk* 12 1 1949 pp. 111-122. [Polish with English summary.]

515.—Kaj, J. Zezierne organizmy reliktowe Pomorza zachodniego. *Badania fizjogr. Polska Zachodnia, Poznań* 2 1950 pp. 157-171 4 figs. [English summary.]

516.—Kamshilov, M. M. & Mironova, N. V. Freshwater crustacea as a food of young gadiformes. *C.R. Acad. Sci. Moscow N.S.* 73 1950 pp. 1097-1099. [In Russian.]

517.—Kändler, R. Untersuchungen über Fortpflanzung, Wachstum und Variabilität der Arten des Sandaals in Ost- und Nordsee, mit besonderer Berücksichtigung der Saisonrassen von *Ammodytes tobianus* L. *Kiel. Meeresforsch.* 5 1941 pp. 45-145 28 figs.

518.—Kändler, R. Über den Steinbutt der Ostsee. *Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart* 11 1944 pp. 73-136 21 figs. 19 tabs.

519.—Kändler, R. Untersuchungen über den Ostseedorsch während der Forschungsfahrten mit dem R. F. D. "Poseidon" in den Jahren 1925-1938. *Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart* 11 1944 pp. 137-245 34 figs. 54 tabs.

520.—Kändler, R. Die Häufigkeit pelagischer Fischeier in der ostsee als Massstab für die Zu- und Abnahme der Fischbestände. *Kiel. Meeresforsch.* 6 1949 pp. 73-89 2 text-figs.

- 521.—Kändler, R. Jahreszeitliches Vorkommen u. unperiodisches Auftreten von Fischbrut, Medusen, u. Dekapodenlarven im Fehmarnbelt in den Jahren 1934-1943. Ber. deutsch. wiss. Kom. Meeresforsch. Stuttgart (N.F.) **12** 1950 pp. 49-85 6 figs. 1 chart 13 tabs.
- 522.—Kar, A. B. & Ghosh, A. Responses of the genital system and the urinogenital papilla of the female catfish, *Heteropneustes fossilis* (Bloch) to sex hormones. Roux Arch. Entw.-Mech. Organ. **144** 1950 pp. 257-264 10 figs.
- 523.—Karandikar, K. R. & Palekar, V. C. Studies on the ovaries of *Polyne-mus tetradactylus* Shaw in relation to its spawning. Current Sci. Calcutta **19** 1950 pp. 154-155.
- 524.—Karandikar, K. R. & Palekar, V. C. Studies on the ovaries of *Polyne-mus tetradactylus* Shaw, in relation to its spawning habits. J. Univ. Bombay **19B** 3 1950 pp. 21-24.
- 525.—Katz, M. Some interesting cells in the blood of a diseased silver salmon fingerling. Copeia **1950** pp. 295-298 1 pl.
- 526.—Katz, M. & Erickson, D. W. The fecundity of some herring from Seal Rock, Washington. Copeia **1950** pp. 176-181 2 figs. 2 tabs.
- 527.—Katz, M. & Southward, M. The blood-clotting time in spent silver salmon, *Oncorhynchus kisutch* (Walbaum). Copeia **1950** p. 150.
- 528.—Kauffman, D. E. Notes on the biology of the Tiger Shark. (*Galeocerdo arcticus*) from Philippine Waters. Res. Rep. U.S. Fish Wildlife Serv. No. 16 1950 pp. 1-10 5 figs.
- 529.—Kawamoto, N. Y. The influence of sex hormones on the reproductive organ of a Sôgyo "*Ctenopharyngodon idellus* (C. & V.)." Jap. J. Ichthyol. Tokyo **1** 1950 pp. 8-16.
- 530.—Kawamura, T. & Motonaga, T. On artificial ovulation in the spinous loach. Jap. J. Ichthyol., Tokyo **1** 1950 pp. 1-7 text-figs. 1-10. [Japanese with English summary.]
- 531.—Kawana, T. Studies on the stock of Hokkaido herring. I. Yearly catch per a trap-net from 1870 to 1946. Contr. Central Fish. Stat. Japan No. 61 1948 pp. 73-76.
- 532.—Kawana, T. Studies on the stock of Hokkaido herring. II. Solar-index and amount of brood. Contr. Central Fish. Stat. Japan No. 72 1948 pp. 181-183.
- 533.—Kawaziri, M. An example of pond fish culture and multiplication in river of "Ayu." Contr. Central Fish. Stat. Japan No. 103 1948 pp. 103-108 figs.
- 534.—Kawaziri, M. Influence of population density upon reproduction on killie-fish. Contr. Central Fish. Stat. Japan No. 104 1948 pp. 166-172 figs.
- 535.—Kawaziri, M., Shimadate, M., Koyama, H. & Miyajima, C. Inducing spawning by hormones of female carp. Contr. Central Fish. Stat. Japan No. 45 1948 pp. 13-16.
- 536.—Kazanski, B. N. Influence of hypophysis on oocytes nuclei in fishes. C.R. Acad. Sci. Moscow N.S. **75** 1950 pp. 311-314 figs. [In Russian.]
- 537.—Kesteven, G. L. Conserving the mullet catch. W. Austral. Fish. Bull. No. 1 1941 pp. 1-14 5 text-figs.
- 538.—Kesteven, G. L. Essay review. J. Conseil, Copenh. **16** 1950 pp. 227-236.
- 539.—Kesteven, G. L. and others. Malayan Fisheries. A handbook prepared for the inaugural meeting of the Indo-Pacific Council, Singapore, March 1949. Singapore, 1949 pp. viii + 88, frontis. 16 pls. 1 map text figs.
- 540.—Kesteven, H. L. The origin of the Tetrapods. Proc. roy. Soc. Vict., N.S. **59** 1950 pp. 93-138 10 figs.
- 541.—Ketchen, K. S. Stratified sub-sampling for determining age distributions. Trans. Amer. Fish. Soc. **79** (1949) 1950 pp. 205-212 3 text-figs.
- 542.—Khlemtzos, C. T. Seventeen cases of poisoning due to ingestion of an eel, *Gymnothorax flavimarginatus*. Amer. J. trop. Med. Baltimore **30** 1950 pp. 785-793.
- 543.—Kibesaki, O. Ecological studies on *Döderleinia berycoides* in the south-western part of Sea of Japan. I. Age and growth. Contr. Central Fish. Stat. Japan No. 107 1948 pp. 221-225.
- Kikuchi, T. see Takahashi, T.

544.—Kimsey, J. B. Some Lahontan fishes in the Sacramento River Drainage, California. Calif. Fish Game **36** 1950 p. 438.

King, G. M. *see* Jones, J. W.

545.—Kirsche, W. Histologische Untersuchungen über das peripherische Nervensystem der Teleostier. Anat. Anz. Jena **96** 1948 pp. 419-454 13 figs.

546.—Kirsche, W. Die regenerativen Vorgänge am Rückenmark erwachsener Teleostier nach operativer Kontinuitätsstrennung. Z. mikr. anat. Forsch. **56** 1950 pp. 190-265 32 figs.

547.—Klaauw, C. J. van der. Size and position of the functional components of the skull. A contribution to the knowledge of the architecture of the skull, based on data in the literature. Arch. néerl. Zool. **9** 1948 pp. 1-176 2 pls. 65 text-figs.

548.—Klaauw, C. J. van der. Architectuur van de schedel. Versl. K. ned. Akad. Wet. Amst. **59** 1950 pp. 40-44 2 text-figs.

549.—Klein, R. M. & Dembrow, V. D. Photographically recorded fertile cross mating of *Aequidens portalegrensis* (female) and *Aequidens latifrons* (male). Aquarium, Philad. **19** 1950 pp. 114-115 2 figs.

550.—Kluge, E. Zucht des Glühlichtsalmmlers *Hyphessobrycon gracilis* (Reinhardt). Deuts. Aquar. Terrar. Z., Stuttgart **3** 1950 pp. 114-115 1 text-fig.

551.—Knudsen, J. Contributions to the biology of the whiting (*Gadus merlangus* L.) in the Danish waters. Rep. Danish biol. Sta. No. 52 1950 pp. 27-40 5 figs. tables.

Koefoed, E. *see* Maul, G. E.

552.—Komárek, J. Česká Zvěřina [The Czech Fauna]. Melantrich [1950] pp. 348 8 pls. col. 192 figs.

553.—Kopsch, Fr. Bildung und Längenwachstum des Embryons, Gastrulation und Konkreszenz bei *Scyllium canicula* und *Scyllium catulus*. Z. mikr. anat. Forsch. **56** 1950 pp. 1-101 158 figs.

554.—Korshuyev, P. A. Requirement of oxygen in erythrocytes of Vertebrates. Bull. Soc. Nat. Moscou Biol. **55** (5) 1950 pp. 82-92. [In Russian.]

555.—Korshuyev, P. & Bulatova, N. On the physiological peculiarities of the erythrocytes in the Chondrostei (Concentration of haemoglobin and intensity of oxygen requirements). C.R. Acad. Moscou N.S. **70** 1950 pp. 149-151. [In Russian.]

556.—Kosswig, C. Erythräische Fische im Mittelmeer und an der Grenze der Agäis. O. Kleinschmidt. Syllegomena Biologica, Leipzig (Geest & Portig) 1950 pp. 203-212.

557.—Kotthaus, A. Oekologische u. fischereiwissenschaftliche Untersuchungen über den Rotbarsch. III. Rassenuntersuchungen am Rotbarsch. A. Rotbarschformen von der norwegischen Küste. Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart (N.F.) **12** 1950 pp. 94-114 14 figs. 6 tabs.

558.—Kotthaus, A. Zur Fortpflanzungsbiologie des Rotbarsches (*Sebastes marinus*). Deuts. Aquar. Terrar. Z., Stuttgart **3** 1950 pp. 83-84 2 text-figs.

559.—Koyama, H. On the effect of some unutilized materials added to the basic food for the carp culture. Contr. Central Fish. Stat. Japan No. 60 1948 pp. 544-547.

Koyama, H. *see* Kawajiri, M.

560.—Kramer, D. A record of the swordfish, *Xiphias gladius* Linnaeus, from the Texas coast. Copeia **1950** p. 65.

Krishnamurthi, B. *see* Chacko, P. I.

561.—Kristensen, I. Ray's Bream, *Brama raii* (Bloch). Amsterdam Nat. **1** 1950 pp. 49-52 1 fig.

562.—Kritzler, H. Broussonet's goby from the brackish water of the lower St. John's river, Florida. Copeia **1950** pp. 64-65.

563.—Kritzler, H. & others. Carotenoid pigmentation of the Pomacentrid fish *Hyphypops rubicunda*. Copeia **1950** pp. 125-138 6 text-figs.

564.—Krüger, K. Erneutes Auftreten der Scharbzunge *Drepanopsetta platessoides* Fabr., in der westlichen Ostsee. Kiel. Meeresforsch. **4** 1942 pp. 18-37.

565.—Krüger, P. Über das Vorkommen von zweierlei Fasern in der Muskulatur von Haien. Z. Naturforsch. Tübingen **5b** 1950 pp. 218-220 1 pl.

566.—Krumholz, L. A. Variations in size and composition of fish populations in recently stocked ponds. Ecology, Brooklyn 29 1948 pp. 401-414 4 text-figs.

Kubota, Z. *see* Fujita, T.

Kuehn, J. H. *see* Moyle, J. B.

567.—Kuhn, O. Lehrbuch der Paläozoologie. Stuttgart, 1949. Pp. v, 1-326 224 text-figs. (the 50 plates are included as text-figs.).

568.—Kulkarni, C. V. Breeding habits, eggs and early life history of the Indian shad, *Hilsa ilisha* (Ham), in the Narbada river. Proc. nat. Inst. Sci. India 16 1950 pp. 169-176 3 text-figs.

Künne, C. *see* Hagmeier, A.

569.—Kupka, E. Die Mitosen- und Chromosomenverhältnisse bei der grossen Schwebrenke *Coregonus wartmanni* (Bloch), des Attersees. Österr. Zool. Z., Wien 2 1950 pp. 605-623 11 figs.

570.—Kurita, S. A theoretical consideration on the method for estimating the yearly survival rate of fish stock by using the age difference between the oldest and the averages. Contr. Central Fish. Stat. Japan No. 37 1948 pp. 1-12 figs.

Kuriyan, G. K. *see* Chacko, P. I.

571.—Kuroda, N. A research on *Bembrops caudimaculata* Steindachner. Jap. J. Ichthyol., Tokyo 1 1950 pp. 57-61 [Japanese with English summary.]

572.—Kvam, T. The development of mesodermal enamel on piscine teeth. Trondheim 1950 pp. 1-115 54 text-figs.

573.—Lachner, E. A. The comparative food habits of the cyprinid fishes *Nocomis biguttatus* and *Nocomis microgobus* in western New York. J. Wash. Acad. Sci. 40 1950 pp. 229-236 tables.

574.—Lachner, E. A., Westlake, E. F. & Handwerk, P. S. Studies on the biology of some Percid fishes from Western Pennsylvania. Amer. midl. Nat. 43 1950 pp. 92-111 9 text-figs.

575.—Ladiges, W. *Cichlasoma hellabrunni* spec. nov. Zool. Anz. 140 1942 pp. 199-202 1 fig.

576.—Ladiges, W. Eine neue *Cynopocilus*-Art? Zool. Anz. 143 1943 pp. 275-277 1 fig.

577.—Ladiges, W. *Microbrycon cohu* spec. nov. eine neue Art der südamerikanischen Glandulocaudinae. Zool. Anz. 145 1950 pp. 305-309 3 figs.

Lakiyan, M. H. *see* Trifonova, A. N.

578.—Larimore, R. W. Gametogenesis of *Polyodon spathula* (Walbaum) a basis for regulation of the fishery. Copeia 1950 pp. 116-124 2 pls.

579.—Larkin, P. A., Anderson, G. C., Clemens, W. A. & Mackay, D. C. G. The production of Kamloops trout (*Salmo gairdnerii kamloops* Jordan) in Paul Lake, British Columbia. Sci. Publ. B.C. Game Dep. No. 1 1950 pp. 1-37.

580.—Laroche, G., Leblond, C. P. & Préfontaine, G. Effets de l'hormone thyroïdienne sur le saumon de l'Atlantique: stade parr. Rev. Canad. Biol., Montréal 9 1950 pp. 101-103 1 text-fig.

Larrañeta, M. G. *see* Andreu, B.

581.—Larsen, K. & Olsen, S. Ochre suffocation of fish in the river Tim Aa. Drainage water from lignite pit as cause of the catastrophes at the Nørre Esp trout pond farm 1941-1947. Rep. Danish biol. Sta. No. 50 1950 pp. 3-27 8 text-figs.

582.—Laskar, K. Beitrag zur Kenntnis der Entwicklungs-geschichte des Flussbarsches (*Perca fluviatilis* L.) Zool. Anz. 143 1943 pp. 277-282 7 figs.

583.—Latil, P. de. La légende de la murène. Nature, Paris 1950 pp. 16-18 2 text-figs.

584.—Laur, C. M. Intervention de l'hypophyse dans les modifications de la teneur en hématies du sang, consécutives à l'injection d'adrénaline. C.R. Soc. Biol. Paris 144 1950 pp. 790-791.

585.—Laursen, D. Contributions to the Quaternary Geology of Northern West Greenland etc. Medd. Grønland 135 8 1944 125 pp. 7 pls. 32 figs. [Pisces p. 80.]

Leblond, C. P. *see* Laroche, G.

586.—Le Cren, E. D. The interrelationships between population, production and growth-rate in freshwater fish. Proc. Linn. Soc. Lond. 161 1949 pp. 131-140 3 text-figs.

587.—Legendre, R. Quelques poissons observés à Concarneau en ces dernières années. Bull. Lab. marit. Dinard No. 33 1950 pp. 2-15.

Legendre, R. *see* Forest, J.

588.—Leghissa, S. Per una migliore conoscenza del tetto ottico nei Teleostei. *Monit. zool. ital. Firenze* **56** Suppl. 1948 pp. 109-112.

589.—Lehmann, C. Wanderung, Wachstum und Bestandsvermehrung von Salmoniden in der Ostsee. *Ber. deutsch. wiss. Kom. Meeresforsch. Stuttgart* **10** 1942 pp. 416-434 9 figs. 12 tabs.

590.—Lehmann, C. Fischereiliche Futtermittelkunde. Demoll & Maier. *Handb. Binnenfischerei Mitteleuropas* **4** pp. 815-922 8 text-figs. Stuttgart, 1945.

591.—Leloup, J. & Olivereau, M. Production d'exophtalmie par la thiourée chez un Téléostéen : *Dentex vulgaris* Cuv. *C.R. Soc. Biol. Paris* **144** 1950 pp. 772-774 2 figs.

Leloup, J. *see* Fontaine, M.

Leonard, F. A. *see* Leonard, J. W.

592.—Leonard, J. W. & Leonard, F. A. An analysis of the feeding habits of rainbow trout and lake trout in Birch Lake, Cass County, Michigan. *Trans. Amer. Fish. Soc.* **76** (1946) 1949 pp. 301-314.

593.—Letaconnoux, R. Notes sur la sardine du Golfe de Gascogne. *Rev. Trav. Pêches marit. Paris* **14** 1948 pp. 33-38 3 text-figs.

594.—Letaconnoux, R. Etude préliminaire de la Sardine du secteur de la Rochelle. *Rapp. Cons. Explor. Mer, Copenh.* **126** 1950 pp. 68-72 6 tabs. 4 figs.

595.—Letaconnoux, R. Préliminaire à l'Etude simultanée de la Sardine sur le Plateau Continental Atlantique. *Rapp. Cons. Explor. Mer, Copenh.* **126** 1950 pp. 74-78 5 figs.

596.—Lewis, W. M. Growth of the white bass, *Lepibema chrysops* (Rafinesque), in Clear Lake, Iowa. *Iowa St. Coll. J. Sci.* **24** 1950 pp. 273-277 tables.

597.—Lewis, W. M. Fisheries investigations on two artificial lakes in southern Iowa II. Fish populations. *Iowa St. Coll. J. Sci.* **24** 1950 pp. 287-323 3 figs. tables.

598.—Lewis, W. M. Fisheries investigations on two artificial lakes in southern Iowa III. History and creel census.

Iowa St. Coll. J. Sci. **24** 1950 pp. 405-420 3 figs. tables.

Leyzorovitch, H. A. *see* Vernidus, M. F.

599.—Liang, Y.-S. Notes on some species of Homalopterid loaches referring to *Pseudogastromyzon* from Fukien, China. *Res. Inst. Zool. Bot. Fukien Prov. Acad.* 1942 No. 1 pp. 1-10 2 text-figs.

600.—Liang, Y.-S. A report on the preliminary observation of fresh-water fishes from Tan-Po. *J. Arts and Sci. Canton* **1** 1946 pp. 9-11.

601.—Lindberg, G. U. Les Poissons larvifères de Turkestan. *Tabl. anal. Faune U.R.S.S.* **25** 1947 pp. 1-56 27 figs.

Lindenberg, A. B. *see* Polonovski, M.

602.—Lindroth, A. Vitality of salmon parr at low oxygen pressure. *Rep. Inst. Freshwater Res., Drottningholm* **29** 1949 pp. 49-50 1 text-fig.

603.—Lindström, Th. 'Lake trout' och fiskutsättnings lönsamhet. *Svensk. Fisk. Tidskr.* **59** 1950 pp. 163-165 3 text-figs. [not seen.]

604.—Lison, L. Recherches sur l'histogenèse de l'émail dentaire chez les Sélaciens. *Arch. Biol., Liège* **60** 1949 pp. 111-135 1 pl., 2 figs.

605.—(Litver, G. M.) Regeneration of white and red musculature in *Misgurnus fossilis*. *C.R. Acad. Sci. Moscou N.S.* **73** 1950 pp. 817-820 figs. [In Russian.]

606.—Lockley, G. J. The families of freshwater fishes of Tanganyika Territory, with a key to their identification. *E. Afr. agric. J.* **14** 1949 pp. 212-218 2 text-figs.

607.—Lopashov, G. V. Contribution to the knowledge of the cell materials taking part in the formation of the pectoral fins in Teleostean fishes. *C.R. Acad. Sci. Moscou N.S.* **70** 1950 pp. 137-140 figs. [In Russian.]

608.—Lowenstein, O. Labyrinth and equilibrium. *Symposia Soc. exp. Biol., Cambridge* No. 4 1950 pp. 60-82 1 text-fig.

609.—Lozano, F. Notas sobre el Bonito del Norte o Albacora [*Germo alalunga* (Gml.)] de Galicia. *Bol. Inst. esp. Oceanogr.* **36** 1950 pp. 1-13 4 figs. 3 tabs.

610.—**Lozano Cabo, F.** Datos sobre repartición geográfica de especies de peces de la costa del NW de Africa. Bol. Soc. esp. Hist. nat. **48** Biol. 1 1950 pp. 5-14.

611.—**Lozano-Rey, L.** Etude systématique des Clupéidés et des Engraulidés de l'Espagne, du Maroc et du Sahara Espagnols. Rapp. Cons. Explor. Mer. Copenh. **126** 1950 pp. 7-20 11 figs.

612.—**Lundbeck, J.** Biologisch-statistische Untersuchungen über die deutsche Hochseefischerei. II. Fangplätze und Fangträge. Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart (N.F.) **10** 1940 pp. 1-115 21 figs. 9 tabs.

613.—**Määr, A.** Über die Aalwanderung im Baltischen Meer auf Grund der Wanderaalmarkierungsversuche im Finnischen und Livischen Meerbusen i. d. J. 1937-1939. Rep. Inst. Freshwater Res. Drottningholm **27** 1947 pp. 1-56 2 text-figs. 1 map.

614.—**Määr, A.** Fertility of char (*Salmo alpinus* L.) in the Faxälven water system, Sweden. Rep. Inst. Freshwater Res. Drottningholm **29** 1949 pp. 57-70 4 text-figs.

615.—**Määr, A.** A supplement to the fertility of Char (*Salmo alpinus* L.) in Faxälven Water System, Sweden. Rep. Inst. Freshwater Res. Drottningholm, **31** 1950 pp. 127-136 1 fig. 3 tabs.

616.—**Macan, T. T.** Survey of a moorland fishpond. J. Animal Ecol. **18** 1949 pp. 160-186.

McConnell, J. A. see Brett, J. R.

617.—**MacDonagh, E. J.** Las Razas de percas o truchas criollas (*Percichthys*) y su valor para la repoblación pesquera. Rev. Mus. La Plata (N.S.) **6** 1950 pp. 71-170 4 pls. 34 text-figs. [English summary.]

618.—**Machado, C.** Bases para a seleção da carpa. Bol. Industria Animal, S. Paulo N.S. **9** 3-4 1947 pp. 52-59 6 text-figs.

619.—**McHugh, J. L. & Walker, B. W.** Rearing marine fishes in the laboratory. Calif. Fish Game **34** 1948 pp. 37-38.

McHugh, J. L. see Hubbs, C. L.

Mackay, D. C. G. see Larkin, P. A.

620.—**Mackenthun, K. M. & Herman, E. F.** A preliminary creel census of perch fishermen on Lake Mendota, Wisconsin. Trans. Wisc. Acad. Sci. Arts Lett. **39** 1949 pp. 141-149. 4 pls. 4 text-figs.

621.—**McLane, W. M.** An albinistic *Ictalurus catus* from Florida. Copeia **1950** p. 149.

622.—**McLane, W. M.** Notes on the food of the largemouth black bass, *Micropterus salmoides floridanus* (Le Sueur), in a Florida lake. Quart. J. Florida Acad. Sci. **12** 1950 pp. 195-201 1 fig. 1 table.

623.—**Maclaren, P. I. R.** The fish and fisheries of the Lower Ogun River. Nigerian Field **15** 1950 pp. 177-181 7 figs.

624.—**Maldonado-Koerdell, M.** Estudio de morfología funcional en vertebrados mexicanos, I. Rev. Soc. Mexicana Hist. nat. **3** 1942 pp. 155-164 pl. xxiv-xxviii.

625.—**Maldonado-Koerdell, M.** Peces fosiles de Mexico, I. Elasmobranchios. Rev. Soc. Mexicana Hist. nat. **9** 1948 pp. 127-135 1 pl.

626.—**Maldonado-Koerdell, M.** Peces fosiles de Mexico. II. Dipnoos, Ganoides y Teleosteos. Rev. Soc. Mexicana Hist. nat. **10** 1949 pp. 241-246 1 map.

627.—**Maliatsky, S.** Les heures précises du frai de l'anchois de la mer Noire. Trav. Sta. biol. Karadagh No. 6 1940 pp. 135-139 2 tables. [Russian with French résumé.]

628.—**Manges, D. E.** Fish tagging studies in TVA storage reservoirs, 1947-1949. J. Tenn. Acad. Sci. **25** 1950 pp. 126-140.

629.—**Mann, H.** Die Einwirkung von Colchicin und Sexualhormonen auf den Sauerstoffverbrauch von Fischen. Zool. Anz. **127** 1939 pp. 315-318.

630.—**Mann, H.** Untersuchungen über die ansteckende Bauchwassersucht des Karpfens und ihre Bekämpfung. Zool. Anz. **131** 1940 pp. 228-238.

Mann, H. see Elster, H.-J.

Mann, H. see Geyer, F.

Manton, S. M. see Saunders, J. T.

631.—**Marshall, N. B.** Fishes from the Cocos-Keeling Islands. Bull. Raffles Mus. Singapore No. 22 1950 pp. 166-205 2 pls.

632.—**Marshall, N. B.** Air bladder structure and vertical distribution in deep sea fishes. Challenger Soc. London 3 2 1950 pp. 26-27. [Abstract.]

633.—**Martin, A. W.** Some remarks on the blood volume of fish. Studies honoring T. Kincaid, Washington 1950 pp. 125-140 1 text-fig.

634.—**Marx, W. & Henschel, J.** Die Befruchtung und Entwicklung von Plattfischeiern in verdünntem Nordseewasser im Vergleich zu den Befunden in der freien Ostsee. Helgol. wiss. Meeresuntersuch. 2 1941 pp. 226-243 32 figs.

635.—**Maser, J.** Studien über die Umbildungen und den Feinbau der von den lateralen occipito-spinalen Nerven versorgten Muskeln der Teleosteer. Zool.-Jahrb. (Anat.) 70 1949 pp. 60-128 39 text-figs.

636.—**Massuti, M. & others.** Nuevas observaciones sobre la sardina y la alacha de Baleares. Bol. Inst. Esp. Oceanogr. 35 1950 pp. 1-7 1 fig. 7 tabs.

Masuda, S. see Higashi, H.

637.—**Matheson, C.** Records of the globefish and filefish. Nature, Lond. 165 1950 p. 193.

Mathews, M. J. see Chacko, P. I.

638.—**Mathur, D. K.** The origin, distribution, and fate of the lipids in the egg food-reserve and embryo of the common English trouts (*Salmo trutta* and *S. irideus*). Abstr. Diss. Univ. Cambridge 1948-49 1950 pp. 28-29.

639.—**Matsubara, K.** Studies on the Scorpaenoid fishes of Japan. I and II. Trans. Sigenkagaku Kenkyusyo, Tokyo Nos. 1 & 2 1943 pp. 1-486 4 pls. 156 text-figs.

640.—**Matsubara, K.** On a rare clupeoid fish, *Rouleina watasei* (Tanaka) taken from Numazu, Shizuoka Prefecture. Jap. J. Ichthyol. Tokyo 1 1950 pp. 25-29 text-figs. 1 and 2. [In Japanese and English.]

641.—**Matsubara, K.** Studies on the fishes of the genus *Polyipnus* found in Japan. Jap. J. Ichthyol. Tokyo 1 1950 pp. 187-197 6 figs. [In Japanese and English.]

642.—**Matsubara, K. & Ochiai, A.** Studies on Hoplichthyidae, a family of mail-cheeked fishes, found in Japan and its adjacent waters. I, II and III. Jap. J. Ichthyol. Tokyo 1 1950 pp. 73-88 2 text-figs. and pp. 145-156 3 text-figs.

643.—**Matsui, I.** On the existence-rate of mature Ayu (*Plecoglossus altivelis* T. & S.) by their sex. J. Shimonoseki Coll. Fish. 1 1949 pp. 1-5 2 figs. [Jap. Eng. Summary.]

644.—**Matsui, I.** On the relationship between the parasitic ratio of parasite and degree of fatness for the Cod (*Gadus macrocephalus* Tilesius). J. Shimonoseki Coll. Fish. 1 1949 pp. 7-11 5 figs. 1 tab. [Jap. Eng. Summary.]

645.—**Matsui, I.** Genetical studies of the Carp. I. On the hybrid of Carp's fry. J. Shimonoseki Coll. Fish. 1 1949 pp. 13-26 16 tabs. 7 figs. [Jap. Eng. summary.]

646.—**Matsui, I.** Genetical studies of the Carp. II. On the morphological characteristics of Tobi-koi (Superior growing carp's group.) J. Shimonoseki Coll. Fish. 1 1949 pp. 27-32 6 tabs. 2 figs. [Jap. Eng. summary.]

647.—**Matsui, I.** Studies on the scales of the important fresh water fishes in Manchuria. J. Shimonoseki Coll. Fish. 1 1949 pp. 33-49 2 pls. 18 tabs.

648.—**Matsui, I.** On the morphological dissimilarity of Ayu (*Plecoglossus altivelis* T. & S.) in the circumstantial difference, sex and scales circuli, and the discrimination of "pond-cultured ayu" and "natural ayu". Jap. J. Ichthyol., Tokyo 1 1950 pp. 17-24 text-figs. 1-13.

649.—**Matsui, I. & Takai, T.** Ecological studies on the important fishes in East China and Yellow Sea. I. Ecological studies on a Croaker, *Pseudosciaena manchurica* (J. et T.) J. Shimonoseki Coll. Fish. 1 1949 pp. 65-89 20 tabs. 10 figs. [Jap. Eng. summary.]

650.—**Matthews, L. H.** Reproduction in the basking shark, *Cetorhinus maximus* (Gunner). Philos. Trans., Lond. 234B 1950 pp. 247-316 11 pls. 24 text-figs.

651.—**Matthews, L. H. & Parker, H. W.** Notes on the anatomy and biology of the Basking Shark, *Cetorhinus maximus* (Gunner). Proc. zool. Soc. Lond. 120 1950 pp. 535-576 8 pls. 15 figs.

- Matthews, S. A. *see* Smith, D. C.
- 652.—Maul, G. E. & Koefoed, E. On a new genus and species of Macrourid fish, *Phalacromacrus pantherinus*. Ann. Mag. nat. Hist. (12) 3 1950 pp. 970-976 1 text-fig.
- Mauro, A. *see* Morrow, J. E.
- Mazumdar, S. R. *see* Mookerjee, H. K.
- 653.—Mazzi, V. Un nucleo non ancora descritto nel meso-diencefalo dei Teleostei. Monit. zool. ital. Firenze 57 1950 pp. 86-93 4 figs.
- 654.—Mazzi, V. Le commisure postotiche nei teleostei. Pubbl. Staz. zool. Napoli 22 1950 pp. 155-188 1 pl. 11 text-figs. [Italian with English summary.]
- 655.—Medlen, A. B. Sperm formation in *Gambusia affinis*. Texas J. Sci. 2 1950 pp. 395-399 4 figs.
- Meehan, O. L. *see* Dobie, J. R.
- 656.—Meinken, H. The *Nannostomus* varieties. Aquarium, Philad. 19 1950 pp. 238-240, 3 text-figs.
- 657.—Melandner, Y. & Montén, E. E. Probable parthenogenesis in *Coregonus*. Hereditas, Lund 36 1950 pp. 105-106. [Abstract.]
- 658.—Meléndez, B. Un notable otolito fossil del Pliocene del "Cerro de los Pisos" (Grenada). Bol. Soc. esp. Hist. nat. 46 1949 (1948) pp. 743-747 2 figs.
- 659.—Menezes, R. S. de. Alimentação de peixe cachorro, "*Lycengraulis barbouri*" Hildebrand, 1943, da bacia do Rio Parnaíba, Piauí (Actinopterygii, Engraulidae). Rev. Brasil. Biol. Rio de Janeiro 10 1950 pp. 285-293 text-figs. 1-2.
- Menezes, R. S. de *see* Oliveira e Silva, S. L. de.
- Menon, M. A. S. *see* Hora, S. L.
- 660.—Menon, M. D. The use of bones other than otoliths, in determining the age and growth-rate of fishes. With an appendix by T. J. Hart. J. Conseil, Copenh. 16 1950 pp. 311-335 7 figs.
- 661.—Menon, M. D. Bionomics of the poor-cod (*Gadus minutus* L.) in the Plymouth area. J. Mar. biol. Ass. U.K. 29 1950 pp. 185-239 2 pls. 16 text-figs.
- Menon, P. M. G. *see* Jones, S.
- 662.—Menschikow, M. I. Neue Vertreter der Ichthyofauna des Irtysh-Beckens. Zool. Anz. 133 1941 pp. 171-179.
- 663.—Merle, R. Les poissons et la guerre. Nature, Paris No. 3178 1950 pp. 45-46 2 text-figs.
- Meyer, D. K. *see* Higginbotham, A. C.
- 664.—Meyer, P. F. Untersuchungen über die Marktanlandungen an Plattfischen der Ostsee in den Jahren 1929 bis 1935 mit einem Nachtrag der Jahre 1936 und 1937. Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart (N.F.) 10 1941 pp. 195-290 35 figs. 90 tabs.
- 665.—Migita, M. & Arakawa, K. Melanophorhormone of fishes. Contr. Central Fish. Stat. Japan No. 39 1948 pp. 241-244 5 figs.
- 666.—Migita, M. & Hashimoto, Y. On the digestion of higher carbohydrates by Zsuaui-hi (*Ctenopharyngodon idellus* Cuvier and Valenciennes). Contr. Central Fish. Stat. Japan No. 112 1948 pp. 259-261.
- 667.—Miller, R. R. *Profundulus hildebrandi* a new Cyprinodontid fish from Chiapas, Mexico. Copeia 1950 pp. 22-30 1 pl.
- 668.—Miller, R. R. Speciation in fishes of the genera *Cyprinodon* and *Empetrichthys*, inhabiting the Death Valley region. Evolution, Lancaster, Pa. 4 1950 pp. 155-163 1 text-fig. 2 maps.
- 669.—Miller, R. R. Notes on the cutthroat and rainbow trouts with the description of a new species from the Gila river, New Mexico. Occ. Pap. Mus. Zool. Univ. Mich. No. 529 1950 pp. 1-42 1 pl.
- 670.—Miller, R. R. A review of the American Clupeid fishes of the genus *Dorosoma*. Proc. U.S. nat. Mus. 100 1950 pp. 387-410.
- Miller, R. R. *see* Bailey, R. M.
- Miller, R. R. *see* Hubbs, C. L.
- 671.—Milne, D. J. Moricetown Falls as a hazard to salmon migration. Bull. Fish. Res. Bd Canada 86 1950 pp. 1-16 7 figs.
- 672.—Minamori, S. Isolating mechanisms in the Striated Spinous Loach, *Cobitis taenia striata*. J. Sci. Hiroshima Univ. Zool. 11 1950 pp. 55-59 1 fig.

Mironova, N. V. *see* Kamshilov, M. M.

673.—Misra, K. S. A check-list of the fishes of India, Burma and Ceylon. *Rec. Indian Mus., Calcutta* **45** 1949 pp. 377–431.

674.—Misra, K. S. On a new species of Scylliorhinid fish from Andaman Sea, Bay of Bengal. *J. zool. Soc. India* **2** 1950 pp. 87–90 1 pl.

675.—Misra, K. S. Sexual dimorphism in *Labeo boggut* (Sykes). *J. zool. Soc. India* **2** 1950 pp. 91–92 1 pl.

Miyajima, C. *see* Kawajiri, M.

Modglin, F. R. *see* Halstead, B. W.

676.—Mohr, E. Funktionslose Träger und Umriß des Membransaumes bei unpaaren Fischflossen. *Zool. Anz.* **130** 1940 pp. 293–299 4 figs.

677.—Mohr, E. Stint (*Osmerus Artedi*). Demoll & Maier. *Handb. Binnenfischerei Mitteleuropas* **3** pp. 504–526 12 text-figs. Stuttgart, 1941.

678.—Mohr, E. Maifische (Clupeiden) Demoll. & Maier. *Handb. Binnenfischerei Mitteleuropas* **3** pp. 527–551 17 text-figs. Stuttgart 1941.

679.—Mohr, E. Die Gattung *Acerina* Cuvier 1817. *Zool. Anz.* **143** 1943 pp. 90–97 4 text-figs.

680.—Monod, T. Sur l'appareil branchiospinal de quelques téléostéens. C.R. 13e Congr. int. Zool. Paris 1948 [1949] pp. 330–331.

681.—Monod, T. Notes d'ichtiologie ouest-africaine. *Bull. Inst. franç. Afrique noire* **12** 1950 pp. 1–71 110 text-figs.

682.—Montalenti, & G. Schartau, O. Ricerche sulle reazioni della fecondazione e sulla presenza dei gamoni nella lampreda (*Lampetra fluviatilis* L.) *Pubbl. Staz. zool. Napoli* **19** 1942 pp. 48–55 4 figs.

Monten, E. *see* Melander, Y.

683.—Moody, W. D. A study of the natural history of the spotted trout, *Cynoscion nebulosus*, in the Cedar Key, Florida, area. *Quart. J. Florida Acad. Sci.* **12** 1950 pp. 147–171 1 pl. 4 figs. tables.

684.—Mookerjee, H. K. & Bhattacharya, R. N. Culture of fish fry in temporary hard waters. *Proc. zool. Soc. Bengal* **2** 1949 pp. 163–171 1 text-fig.

685.—Mookerjee, H. K. & Ganguly, D. N. On the life history of the carp *Labeo gonius* (Ham.) *Proc. zool. Soc. Bengal* **2** 1949 pp. 173–184 1 pl.

686.—Mookerjee, H. K., Ganguly, D. N. & Bhattacharya, R. N. On the bionomics, breeding habits and development of *Ophicephalus striatus* Bloch. *Proc. zool. Soc. Bengal* **1** 1948 pp. 58–64 2 pls.

687.—Mookerjee, H. K. & Mazumdar, S. R. Some aspect of the life history of *Clarias batrachus* (Linn.) *Proc. zool. Soc. Bengal* **3** 1950 pp. 71–79 2 pls.

688.—Mookerjee, S. The morphology and development of scales in *Glossogobius giuris* (Hamilton). *Proc. zool. Soc. Bengal* **1** 1948 pp. 13–21 1 pl. 2 text-figs.

689.—Moore, G. A. Fine-mesh nets for fish collections. *Copeia* **1950** p. 319.

690.—Moore, G. A. The cutaneous sense organs of barbeled minnows adapted to life in the muddy waters of the Great Plains region. *Trans. Amer. micr. Soc. Menasha* **69** 1950 pp. 69–95 20 text-figs.

691.—Moore, G. A. & Cross, F. B. Additional Oklahoma fishes with validation of *Poeciliichthys parvipinnis* (Gilbert and Swain). *Copeia* **1950** pp. 139–148.

692.—Moore, G. A. & Paden, J. M. The fishes of the Illinois River in Oklahoma and Arkansas. *Amer. midl. Nat.* **44** 1950 pp. 76–95 1 fig.

693.—Moore, H. L. The occurrence of a black marlin, *Tetrapterus mazara*, without spear. *Pacific Sci. Honolulu* **4** 1950 p. 164.

694.—Moore, W. G. Limnological studies of Louisiana lakes. I. Lake Providence. *Ecology, Lancaster, Pa.* **31** 1950 pp. 86–99 4 figs. tables.

695.—Moortazi, F. F. Differentiation and character of the vital staining of the periderm in the development of *Misgurnus*. *C.R. Acad. Sci. Moscou N.S.* **70** 1950 pp. 157–160 fig. [In Russian.]

696.—Morrow, J. E. & Mauro, A. Body temperatures of some marine fishes. *Copeia* **1950** pp. 108–116 4 text-figs.

Motonaga, T. *see* Kawamura, T.

697.—Mott, J. C. The gross anatomy of the blood vascular system of the Eel *Anguilla anguilla*. Proc. zool. Soc. Lond. **120** 1950 pp. 503–518 1 pl. 14 figs.

698.—Moyle, J. B. Gill nets for sampling fish populations in Minnesota waters. Trans. Amer. Fish. Soc. **78** (1948) 1950 pp. 195–204.

699.—Moyle, J. B. Fish-population concepts and management of Minnesota lakes for sport fishing. Trans. Fourteenth N. Amer. Wildlife Conference (1949) Washington (? 1950) pp. 283–294.

700.—Moyle, J. B., Kuehn, J. H. & Burrows, C. R. Fish-population and catch data from Minnesota lakes. Trans. Amer. Fish. Soc. **78** (1948) 1950 pp. 163–175.

701.—Munro, I. S. R. Revision of *Bregmaceros* with descriptions of larval stages from Australasia. Proc. roy. Soc. Queensland **59** 1950 pp. 37–53 10 text-figs.

702.—Munro, I. S. R. The rare Gempylid fish, *Lepidocybium flavo-brunneum* (Smith). Proc. roy. Soc. Queensland **60** 1950 pp. 31–41 1 pl. 3 text-figs.

703.—Murakami, S. & Shindo, S. Studies on the stocks of some economically important marine fishes caught around Amakusa. I. Results of measurements of the flying-fish *Cypsilurus agoo* (Temminck and Schlegel). II. A study of the Japanese anchovy, *Engraulis japonicus* Temminck and Schlegel. III. On the Japanese sardine, *Sardinia melanosticta* (Temminck and Schlegel), of Amakusa. IV. Some observations on the round-herring, *Etrumeus micropus* (Temminck and Schlegel.) V. A consideration on the age of *Trachurus japonicus* (Temminck and Schlegel.) VI. On the snapper, *Pagrosomus major* (Temminck and Schlegel), of Amakusa. Contr. Central Fish. Sta. Japan Nos. 94–99 1948 pp. 109–124 and pp. 155–160.

Murphey, E. W. see Wales, J. H.

704.—Murphy, G. I. A contribution to the life history of the Sacramento Perch (*Archoplites interruptus*) in Clear Lake, Lake County, California. Calif. Fish Game **34** 1948 pp. 93–100 2 figs. 2 graphs.

705.—Murphy, G. I. Notes on the biology of the Sacramento Hitch (*Lavi-*

nia e exilicauda) of Clear Lake, Lake County, California. Calif. Fish Game **34** 1948 pp. 101–110 5 figs. 2 graphs.

706.—Murray, H. W. H. Physical and ecological changes and their effect upon game fish in Bark Lake, Co. Argenteuil, Province of Quebec. Nat. canad., Québec **77** 1950 pp. 47–54 1 map.

Murti, N. N. see Patakoot, R. S.

707.—Myers, G. S. Systematic notes on some Amazonian Clupeid fishes of the genus *Ilisha*. Copeia **1950** pp. 63–64.

708.—Myers, G. S. Flying of the Halfbeak, *Euleptorhamphus*. Copeia **1950** p. 320.

709.—Myers, G. S. On the characid fishes called *Hydrocynus* and *Hydrocyon* by Cuvier. Proc. Calif. zool. Club **1** 1950 pp. 45–47.

710.—Myers, G. S. Identity of the Stromateid fish *Centrolophus californicus* with *Icichthys lockingtoni*. Stanford Ichthyol. Bull. **3** 1950 p. 181.

711.—Myers, G. S. Supplementary notes on the Flying Characid Fishes, especially *Carnegiella*. Stanford Ichthyol. Bull. **3** 1950 pp. 182–183.

712.—Myers, G. S. Studies on South American fresh-water fishes. II. The genera of Anostomine Characids. Stanford Ichthyol. Bull. **3** 1950 pp. 184–198 3 figs.

713.—Myers, G. S. & Böhlke, J. A new lump-sucker of the genus *Eumicrotremus* from the northwestern Atlantic. Stanford Ichthyol. Bull. **3** 1950 pp. 199–202 1 fig.

Myers, G. S. see Bolin, R. L.

Myers, G. S. see Rivas, L. R.

Nachmansohn, D. see Coates, C. W.

714.—Nair, R. V. & Bhimachar, B. S. On some eel eggs and larvae from the Gulf of Manaar. Proc. Indian Acad. Sci. **31B** 1950 pp. 331–338 11 figs.

715.—Nakai, Z. The identification of pelagic eggs of Japanese sardine *Sardinia melanosticta* (Temminck and Schlegel) and gizzard shad, *Clupanodon punctatus* (Temminck and Schlegel). Contr. Central Fish. Stat. Japan No. 24 1948 pp. 141–142 figs.

716.—Nakamura, K. On artificial breeding of Kijuri-no. (*Osmerus dentex* Steindachner). Contr. Central Fish. Stat. Japan No. 43 1948 pp. 259-261.

717.—Nakamura, K. The effect of sea-water salinity on the artificial breeding of Kyurius (*Osmerus dentex* Steindachner). Contr. Central Fish. Stat. Japan No. 66 1948 pp. 93-96.

718.—Nakamura, M. Notes on the Chinese cyprinids, *Otenopharyngodon idellus* (Cuv. et Val.) and *Hypophthalmichthys molitrix* (Cuv. et Val.) propagating in Japan. Misc. Rep. Res. Inst. nat. Resour. Tokyo No. 14 1949 pp. 31-35 5 figs. [English summary.]

719.—Nani, A. Nota preliminar sobre la biología de la lamprea argentina "*Geotria australis*" Gray. 1st Congr. nac. Pesq. Mar. d. Plata 2 1950 pp. 147-166 4 figs.

720.—Nani, A. Una nueva subespecie de "Surel" *Trachurus picturatus australis* (Pisc. Fam. Carangidae.) 1st Congr. nac. Pesq. Mar. d. Plata 2 1950 pp. 167-194 2 figs.

Navarro, F. see Bardan, E.

Navarro, F. see Massuti, M.

Navarro, F. de P. see Fernandez, R.

Navarro, F. de P. see Navaz, J. M.

721.—Navaz, J. M. Contribución al estudio de los Escómbridos de la costa vasca (Atun, bonitos y melva). Bol. Inst. Esp. Oceanogr. No. 31 1950 pp. 1-21 4 text-figs.

722.—Navaz, J. M. & Navarro, F. de P. Nuevos datos sobre la Sardina y la anchoa de la costa vasca. Bol. Inst. Esp. Oceanogr. No. 32 1950 pp. 1-8 2 figs. 7 tabs.

723.—Negus, V. E. The comparative anatomy and physiology of the larynx. London (W. Heinemann) 1949, pp. xix + 230, 191 figs.

724.—Neil, R. M. Zoology of the young *Salmo*. Challenger Soc. London 3 2 1950 pp. 18-19. [Abstract.]

725.—Neill, W. T. An estivating Bowfin. Copeia 1950 p. 240.

726.—Neill, W. T. A channel Catfish with a forked barbel. Copeia 1950 p. 317.

727.—Newth, D. R. Fate of the neural crest in lampreys. Nature, Lond. 165 1950 p. 284 1 text-fig.

728.—Nichols, J. T. Results of the Archbold Expeditions No. 62. Fresh-water fishes from Cape York, Australia. Amer. Mus. Novit. No. 1433 1949 pp. 1-8.

729.—Nichols, J. T. A new *Collichthys*, with remarks on this genus of fishes. Amer. Mus. Novit. No. 1445 1950 pp. 1-3.

730.—Nichols, J. T. *Hildebrandella*, a new generic name for a Carangid fish from the Philippines. Copeia 1950 pp. 19-21 1 text-fig.

731.—Nicol, J. A. C. Autonomic nervous system of the ratfish. Nature, Lond. 165 1950 pp. 854-855.

732.—Nicol, J. A. C. The autonomic nervous system of the chimaeroid fish *Hydrolagus coliei*. Quart. J. micr. Sci. 91 1950 pp. 379-399 2 pls. 8 figs.

733.—Nicolukin, N. I. & Timofeyeva, N. A. Hybridisation of *Acipenser güldenstädti* and *A. ruthenus*. C.R. Acad. Sci. Moscou N.S. 71 1950 pp. 967-970. [In Russian.]

734.—Nikiforov, N. D. & Trusov, V. Z. Influence of temperature on the embryonic development in fish. C.R. Acad. Sci. Moscou N.S. 73 1950 pp. 209-211 figs. [In Russian.]

735.—Nikoljukin, N. J. Über den künstlich erzeugten Bastard von *Rutilus rutilus* (Linné) × *Leuciscus danilewski* (Kessler). Zool. Anz. 133 1941 pp. 277-285 1 fig.

736.—Nikolski, G. V. Contribution to the systematics of the genus *Gobio* in the Amur basin. Bull. Soc. Nat. Moscou Biol. 55 (5) 1950 pp. 59-68 figs. [In Russian.]

737.—Nikolski, G. V. The biological analysis of the size of the catch and the method of controlling the quantity of the fish shoal. Zool. Journ. Moscow 29 1950 pp. 16-26. [In Russian.]

738.—Nikolski, G. V. The dynamics of the numbers in fish shoals and so called problem of the water basin productivity. Zool. Journ. Moscow 29 1950 pp. 489-500. [In Russian.]

739.—Nikolski, G. V. & Sokolova, N. Y. The ways to appropriate for fish farming the reservoirs of the forest-protecting belt Kamishin-Stalingrad. Zool. Journ. Moscow **29** 1950 pp. 218-232 diagrams. [In Russian.]

740.—Nümann, W. Artbildungsvorgänge bei Forellen (*Salmo lacustris* und *S. carpio*). Biol. Zbl., Leipzig **66** 1947 pp. 77-81.

741.—Nümann, W. & Sella, M. Über die Zahl und Zählung von Flossenstrahlen bei Forellen. Thalassia, Venezia **5** 9 1943 pp. 3-16 1 text-fig.

742.—Nybelin, O. Cottiden-Studien. Zool. Anz. **133** 1941 pp. 215-224 2 figs.

743.—Nybelin, O. Fishes collected by the "Skagerak" expedition in the Eastern Atlantic 1946. Göteborgs VetenskSamh. Handl. (6B) **5** 16 1948 pp. 1-95 6 pls.

744.—Nybelin, O. Lyrknöten, *Trigla lyra* L., en för Sverige ny havsfisk. Fauna och Flora, Uppsala **1950** 4 pp. 136-140 2 figs.

Ochiai, A. see Matsubara, K.

745.—O'Driscoll, D. Salmon of the Drumcliffe river. Sci. Proc. R. Dublin Soc. N.S. **25** 1950 pp. 117-130 3 text-figs.

746.—Oliphant, V. L. Periodicity and critical stages in the larval development in the Baikal omul (*Coregonus migratorius*). C.R. Acad. Sci. Moscow N.S. **46** 1945 pp. 250-253.

747.—Oliva, O. Řízek Kesslerův (*Gobio kessleri* Dybowski 1862), nová naše ryba. Acta Rerum nat. Districtus Ostrav., Cpava **11** (4) 1950 pp. 341-344. [Czech with English summary.]

748.—Oliva, O. Sykavec horský—*Cobitis aurata* (De Filippi 1865)—na Moravě. Zvláštní otisk z Akvaristických listů **22** (7) 1950 [Czech with English summary.]

749.—Oliva, O. K nálezu říška *Gobio belingi* Slastenenko 1934 a *Gobio kessleri* Dybowski 1862 [Cyprinidae-Gobiini] v Československu. Zvláštní otisk z Akvaristických listů **22** (7) 1950. [Czech, with English summary.]

750.—Oliveira, P. E. de & Santos, R. da S. Fósseis cretáceos da Ilha de Itamaracá. An. Acad. Brasil. Cienc. Rio de Janeiro **22** 1950 pp. 107-113 1 pl.

751.—Oliveira e Silva, S. L. de & Menezes, R. S. de. Alimentação de curvina, "*Plagioscion squamosissimus*" (Heckel, 1840) da Lagoa de Nazaré, Piauí (Actinopterygii, Sciaenidae). Rev. Brasil. Biol. Rio de Janeiro **10** 1950 pp. 257-264.

752.—Oliver, M. Estudios sobre el Espadín (*Chupea sprattus* L.) de la costa noroeste de España. Bol. Inst. Esp. Oceanogr. No. **26** 1950 pp. 1-15 3 text-figs.

753.—Olivereau, M. Influence d'une augmentation de salinité sur l'activité thyroïdienne de divers Téléostéens d'eau douce. C.R. Soc. Biol. Paris **144** 1950 pp. 775-776.

754.—Olivereau, M. Action de divers antithyroïdiens sur la gland thyroïde des Sélaciens *Scyllium stellare* Flem. et *Scyllium canicula* L. C.R. Soc. Biol. Paris **144** 1950 pp. 832-834.

Olivereau, M. see Leloup, J.

Olsen, S. see Larsen, K.

755.—Omarkhan, M. The development of the chondrocranium of *Notopterus*. J. Linn. Soc., Lond. **41** 1950 pp. 608-624 12 text-figs.

756.—Oppenheimer, J. M. Experimental studies on the development of structure and function in the central nervous system of *Fundulus* embryos. Yearb. Amer. phil. Soc. **1947** 1948 pp. 143-145.

757.—Oppenheimer, J. M. Functional regulation in *Fundulus heteroclitus* embryos with abnormal central nervous systems. J. exp. Zool. **115** 1950 pp. 461-491 5 pls. 5 tabs.

758.—Orces, V. G. Sobre una colección de peces marinos obtenida en el noroeste del Ecuador. Bol. Inform. Cient. Nac. Quito **3** 1950 pp. 294-320.

759.—Orcutt, H. G. The life history of the Starry Flounder *Platichthys stellatus* (Pallas). Fish. Bull., Sacramento No. **78** 1950 pp. 1-68 1 pl. 52 figs. 14 tabs.

Ordal, E. J. see Rucker, R. R.

760.—Orkin, P. A. A history of the Opah *Lampris guttatus* (Brünnich.) Scot. Nat. **62** 1950 pp. 129-141 fig.

761.—Orlova, G. N. On the regeneration of the skin in minnow. C.R. Acad. Sci. Moscow N.S. **70** 1950 pp. 699-702 figs. [In Russian.]

762.—Orlova, G. N. Regeneration of the somatic musculature in Cyclostomata. C.R. Acad. Sci. Moscow N.S. **74** 1950 pp. 127–130 figs. [In Russian.]

763.—Ostroumov, A. A. Rate of sexual maturity of *Caspialosa caspia* (Eichw.) Zool. J., Moscow **28** 1949 pp. 447–452 2 diagr.

Paden, J. M. see Moore, G. A.

Palekar, V. C. see Karandikar, K. R.

764.—Palmer, G. A new species of electric ray of the genus *Diplobatis* from British Guiana. Ann. Mag. nat. Hist. (12) **3** 1950 pp. 480–484 3 text-figs.

765.—Palmer, G. Additions to the fish fauna of Christmas Island, Indian Ocean. Bull. Raffles Mus. Singapore No. 23 1950 pp. 200–205.

Parker, H. W. see Matthews, L. H.

766.—Parrington, F. R. The Skull of *Dipterus*. Ann. Mag. nat. Hist. (12) **3** 1950 pp. 534–547 5 text-figs.

767.—Parrish, B. B. Brood fluctuations in the North Sea haddock population. Challenger Soc. London **3** 2 1950 p. 18. [Abstract.]

768.—Parsons, J. W. Life history of the yellow perch, *Perca flavescens* (Mitchell), of Clear Lake, Iowa. Iowa St. Coll. J. Sci. **25** 1950 pp. 83–97 tables.

769.—Pasquali, A. Contributo allo studio dell'ermofroditismo e del differenziamento della gonade nell'orato (*Sparus auratus* L.) Pubbl. Staz. zool. Napoli **18** 1941 pp. 282–312 5 pls. 5 figs.

770.—Patakoot, R. S., Pradhan, L. P. & Murti, N. N. Fat content of the muscles of some marine fishes of Bombay. J. Univ. Bombay N.S. **18B** 5 1950 pp. 3–6.

771.—Pavlovskaya, R. M. Propagation of the food-fishes in Karkinitsk Bay and in other parts of the Black Sea. C.R. Acad. Sci. Moscow N.S. **70** 1950 pp. 311–313 figs. [In Russian.]

772.—Peiss, C. L. & Field, J. The respiratory metabolism of excised tissues of warm- and cold-adapted fishes. Biol. Bull. Woods Hole **99** 1950 pp. 213–224 5 tabs. 3 figs.

773.—Perlmutter, A. & Clarke, G. M. Age and growth of immature rosefish (*Sebastes marinus*) in the Gulf of Maine and off Western Nova Scotia. Fish

Bull. U.S. Fish Wildlife Serv. No. 45 1949 pp. 207–228 21 text-figs.

774.—Perryman, A. D. A simple otolith cutter. J. Conseil, Copenh. **17** 1950 pp. 37–39 3 text-figs.

775.—Persov, G. M. Influence of conditions of surroundings on embryonic development of *Misgurnus fossilis*. C.R. Acad. Sci. Moscow N.S. **73** 1950 pp. 213–216 figs. [In Russian.]

776.—Peters, H. M. Fortpflanzungsbiologische und Tiersoziologische Studien an Fischen. 1. *Hemichromis bimaculatus* Gill. Z. Morph. Ökol. Tiere **37** 1940 pp. 387–425 14 text-figs.

777.—Peters, H. M. Über Bau, Entwicklung und Funktion eines eigenartigen hydrostatischen Apparates larvaler Labyrinthfische. Biol. Zbl., Leipzig **66** 1947 pp. 304–329 21 figs.

778.—Peters, H. M. Das Rätsel des Instinktes. II. Beispiel einer vergleichenden Untersuchung. Nat. u. Volk **80** 1950 pp. 181–188 5 figs.

779.—Peterson, B. Artificiell gödning av Havsvatten. Fauna och Flora, Uppsala **1950** pp. 21–31 3 text-figs. [N.V.]

780.—Piaff, J. R. and others. Braestrup, F. W. Vort Lands Dyreliv **2** pp. 9–122 101 text-figs. Kobenhavn, Gyldendalske Boghandel 1950.

781.—Phillips, J. B. Basking shark fishery revived in California. Calif. Fish. Game **34** 1948 pp. 11–23 7 figs.

782.—Phillips, J. B. Pacific cod off Northern California. Calif. Fish Game **36** 1950 p. 439 1 fig.

783.—Pillay, T. V. R. On the food and feeding adaptations of the grey mullet *Mugil tade* Forsk. Science & Culture, Calcutta **16** 1950 pp. 261–262.

784.—Pillay, T. V. R. & Sarojini, K. K. On the larval development of the Indian transparent goby, *Gobiopterus chuno* (Hamilton) with observations on its bionomics. Proc. nat. Inst. Sci. India **16** 1950 pp. 181–187 4 figs.

785.—Pillay, T. V. R. & Shaw, J. S. The inland fisheries of Kodinar in Kathiawar. J. Bombay. nat. Hist. Soc. **48** 1949 pp. 775–781 1 text-fig.

786.—Piroshnikov, P. L. Data on biology of the *Osmerus eperlanus dentex* in Asia. C.R. Acad. Sci. Moscow N.S. **74** 1950 pp. 1037–1040. [In Russian.]

- 787.**—Piroshnikov, P. L. The nutrition of Coregonidae in the river mouth areas. Zool. Journ. Moscow **29** 1950 pp. 140–146. [In Russian.]
- Pitts, M. W.** *see* Browne, M. J.
- Pitts, R. F.** *see* Browne, M. J.
- 788.**—Plateau, H. Les introductions de poissons nouveaux dans le lac du barrage de l'Oued N'Fis. Bull. Soc. Sci. nat. Maroc **28** 1950 pp. 167–171.
- 789.**—Polenonov, A. L. Morphology of neurosecretory cells of hypothalamus and the connection of these cells with the gonadotropic function of hypophysis in *Cyprinus carpio* and *C. carassius*. C.R. Acad. Sci. Moscou N.S. **73** 1950 pp. 1025–1028 figs. [In Russian.]
- 790.**—Poll, M. Description de deux Poissons percomorphes nouveaux des eaux cotières africaines de l'Atlantique Sud (1948–1949.) Bull. Mus. Hist. nat. Belg. **26** No. 49 1950 pp. 1–14 2 figs.
- 791.**—Poll, M. Description de deux Cichlidae pétricoles du lac Tanganika. Rev. zool. Bot. afr., Tervuren **43** 1950 pp. 292–302 6 figs.
- 792.**—Poll, M. Les poissons géants du Congo. Zooleo, Leopoldville, N.S. No. 6 1950 pp. 3–8 (sep. pag.)
- Pollard, C. B.** *see* Harmon, R. W.
- 793.**—Polonovski, M. & Lindenberg, A. B. Sur un aspect de la régulation osmotique chez les Téléostéens sténo et eury-halins. C.R. 13e Congr. int. Zool. Paris 1948 [1949] pp. 388–389.
- 794.**—Ponse, K. La différenciation du sexe et l'intersexualité chez les vertébrés. Lausanne, 1949.
- 795.**—Postel, E. Les Thonidés de l'Atlantique tropical. Nature, Paris No. 3181 1950 pp. 154–155 4 text-figs.
- 796.**—Poulsen, E. M. La Pêche, la Ponte et les Races de Sprats dans les Eaux Danoises. Rapp. Cons. Explor. Mer, Copenh. **126** 1950 pp. 92–95 6 figs.
- 797.**—Poulsen, E. M. The sprat fishery and the sprat populations in the Danish waters. Rep. Danish. biol. Sta. No. 52 1950 pp. 3–26 6 figs. tables.
- Power, E. A.** *see* Anderson, A. W.
- 798.**—Prabhu, M. S. On the breeding habits of the ribbon fish *Trichiurus hawaiiensis* (Forsk.) Current Sci., Bangalore **19** 1950 pp. 213–214.
- Pradhau, L. B.** *see* Patakoot, R. S.
- 799.**—Praeger, R. L. Natural History of Ireland, London 1950 [fishes pp. 208–219.]
- Préfontaine, G.** *see* Laroche, G.
- 800.**—Privolnev, T. I. Critical concentration of oxygen for various ages of young salmon (*Salmo salar*). C.R. Acad. Sci. Moscou N.S. **58** 1947 pp. 1179–1181. [In Russian.]
- 801.**—Privolnev, T. I. The catalysis of fish. C.R. Acad. Sci. Moscou N.S. **70** 1950 pp. 461–463. [In Russian.]
- 802.**—Probatov, A. N. Peculiarities of fish nutrition in the waters of the far North. C.R. Acad. Sci. Moscou N.S. **56** 1947 pp. 667–668. [In Russian.]
- 803.**—Probatov, A. N. The fishes of river Kuma. C.R. Acad. Sci. Moscou N.S. **58** 1947 pp. 1211–1214. [In Russian.]
- Proctor, A.** *see* Tubb, J. A.
- 804.**—Puke, C. Experiments in Lake Vänern on the influence on fish of bomb-dropping. Rep. Inst. Freshwater Res. Drottningholm **29** 1949 pp. 71–74 1 text-fig.
- 805.**—Puke, C. The possibility of avoiding winter-kill of fish. Rep. Inst. Freshwater Res. Drottningholm **31** 1950 pp. 137–146 3 figs. 4 tabs.
- 806.**—Pulley, T. E. The effect of aluminium chloride in small concentration on various marine organisms. Texas J. Sci. **2** 1950 pp. 405–411 tables.
- 807.**—Pumphrey, R. J. Hearing. Symposia Soc. exp. Biol., Cambridge No. 4 1950 pp. 3–18 6 text-figs.
- 808.**—Pyefinch, K. A. The brown trout research scheme. Challenger Soc. London **3** 2 1950 p. 19. [Abstract.]
- 809.**—Pyefinch, K. A. Report of the Officer-in-charge of the Brown Trout Research Laboratory. Sci. Invest. Freshwater Fish. Res., Edinb. **1** 1950 pp. 7–11.
- 810.**—Quenouille, M. H. A statistical analysis of some pre-war haddock data. Challenger Soc. London **3** 2 1950 p. 17. [Abstract.]
- 811.**—Radcliffe, R. W. The effect of fin-clipping on the cruising speed of goldfish and coho salmon fry. J. Fish. Res. Board, Canada **8** 1950 pp. 67–73.

- 812.**—Rae, B. B. The pre- and post-war stocks of lemon soles at Faeroe. Challenger Soc. London **3** 2 1950 pp. 16–17. [Abstract.]
- 813.**—Raffy, A. L'euryhalinité de *Blennius pholis* L. C.R. Soc. Biol. Paris **143** 1949 pp. 1575–1576.
- Raffy, A. see Fontaine, M.
- Rao, S. N. see Alikunhi, K. H.
- 814.**—Rasmussen, B. Observations on cod during the cruise of M/S. "Vardholm" in 1949. Ann. Biol., Copenh. **6** 1949 [1950] pp. 40–42 1 fig.
- 815.**—Rasmussen, T. Is the Icelandic "Nordurlandsild" identical with the Norwegian winter herring. Fiskeridir. Skrift. Havundersøk., Bergen **9** No. 7 1950 pp. 1–13 5 text-figs.
- Rasquin, P. see Breder, C. M.
- 816.**—Rass, T. S. On the "long" Pleuronectidae: *Microstomus*, *Glyptocephalus* and *Tanakius* in the Far-East Seas of U.S.S.R. C.R. Acad. Sci. Moscou N.S. **74** 1950 pp. 855–857 figs. [In Russian.]
- 817.**—Rass, T. S. New deep-sea fish of Pacific *Gonostoma vitiazi* nova species (Pisces, Gonostomatidae.) C.R. Acad. Sci. Moscou N.S. **74** 1950 pp. 1041–1043 fig. [In Russian.]
- 818.**—Rauther, M. Die Pseudobranchie einer augenlosen Karausche. Zool. Anz. **130** 1940 pp. 289–293 2 figs.
- 819.**—Rauther, M. Einige Beobachtungen über den Tentakelapparat von *Ceratias holbölli* (Teleostei, Pediculati.) Zool. Anz. **136** 1941 pp. 131–140 3 figs.
- 820.**—Rauther, M. Über *Pelecus cultratus* (L.) im Vergleich mit anderen "Beilfischen." Neue Ergebn. u. Probleme der Zoologie (Klatt-Festschrift), Leipzig 1950 pp. 794–804 10 text-figs.
- 821.**—Rawson, D. S. The physical limnology of Great Slave Lake. J. Fish. Res. Board, Canada **8** 1950 pp. 1–66 21 text-figs.
- 822.**—Raymont, J. E. G. A fish cultivation experiment in an arm of a sea-loch. IV. The bottom fauna of Kyle Scotnish. Proc. roy. Soc. Edinb. **64B** 1950 pp. 65–108 8 text-figs.
- 823.**—Reid, G. K. Notes on the centrarchid fish *Mesogonistius chaetodon elizabethae* in peninsular Florida. Copeia **1950** pp. 239–240.
- 824.**—Reid, G. K. The fishes of Orange Lake, Florida. Quart. J. Florida Acad. Sci. **12** 1950 pp. 173–183.
- Rein, F. H. see Dohrn, A.
- Reintjes, J. W. see Schaefer, M. B.
- 825.**—Rendahl, H. & Vestergren, G. Eine neue Art der Gattung. *Glyptosternon* s. str. aus dem nordöstlichen Birma. Zool. Anz. **133** 1941 pp. 213–214.
- Reynolds, J. see Goodrich, H. B.
- Richardson, I. D. see Hodgson, W. C.
- 826.**—Richter, R. Massensterben im Meere, Auftriebwasser und Erdöl-Bildung. Natur u. Volk **80** 1950 pp. 21–28 3 pls.
- 827.**—Ricker, W. E. Cycle dominance among the Fraser sockeye. Ecology, Lancaster, Pa. **31** 1950 pp. 6–26 1 fig. tables.
- 828.**—Rieser, D. E. Fish migration. Discovery, Norwich **11** 1950 pp. 184–185 2 text-figs.
- 829.**—Ripley, W. E. An extension of the range of *Lavaris imperialis* Rafinesque. Calif. Fish Game **34** 1948 pp. 39–40.
- Ripley, W. E. see Roedel, P. M.
- Ripplinger, J. see Jullien, A.
- 830.**—Rivas, L. R. A revision of the American Clupeid fishes of the genus *Harengula*, with descriptions of four new subspecies. Proc. U.S. nat. Mus. **100** 1950 pp. 275–309 3 pls. 41 text-figs.
- 831.**—Rivas, L. R. & Myers, G. S. A new genus of Poeciliid fishes from Hispaniola, with notes on genera allied to *Poecilia* and *Mollienesia*. Copeia **1950** pp. 288–294 1 pl. 1 fig.
- 832.**—Rivero, L. H. Asociaciones en los peces. Bol. Hist. nat., Habana **1** 1950 pp. 113–116 2 figs.
- Rixon, A. E. see Toombs, H. A.
- 833.**—Roberts, T. D. M. The respiratory movements of the lamprey (*Lampetra fluviatilis*). Proc. roy. Soc. Edinb. **64B** 1950 pp. 235–252 10 text-figs.
- 834.**—Robertson, G. M. Species criteria in Osteostraci, with special reference to the genus *Tremataspis*. Amer. J. Sci. New Haven **248** 1950 pp. 335–346.

- Rodriguez-Roda, J. *see* Andreu, B.
- 835.—Roedel, P. M. Occurrence of the Black Skipjack, (*Euthynnus lineatus*) off Southern California. Calif. Fish Game 34 1948 pp. 38-39.
- 836.—Roedel, P. M. Notes on two species of sharks from Baja California. Calif. Fish Game 36 1950 pp. 330-332 2 text-figs.
- 837.—Roedel, P. M. & Ripley, W. E. California sharks and rays. Fish Bull., California No. 75 1950 pp. 1-88 65 text-figs.
- Roland, J. *see* Dieuzeide, R.
- 838.—Rollefsen, G. Fluctuations in two of the most important stocks of fish in northern waters, the cod and the herring. Rapp. Cons. explor. Mer, Copenh. 125 1949 pp. 33-35.
- 839.—Romanini, M. G. Sulla presenza di un fattore diffusore nel Capo di *Petromyzon planeri*. Monit. zool. ital. Firenze 57 1949 pp. 37-38.
- 840.—Rose, E. T. A fish population study of Storm Lake. Proc. Iowa Acad. Sci. 56 [1950] pp. 385-395 1 fig. tables.
- 841.—Rosenthal, H. L. Salt and water regulation in fishes Pt. I & II. Aquarium, Philad. 19 1950 pp. 174-177 2 text-figs. and pp. 186-188 2 text-figs.
- Roth, H. *see* Rötheli, A.
- 842.—Rötheli, A. & Roth, H. Elektronenoptische Untersuchungen an Salmonidenspermien. Rev. suisse Zool., Genève 57 1950 pp. 503-510 3 figs.
- 843.—Rucker, R. R., Johnson, H. E. & Ordal, E. J. An investigation of the bactericidal action and fish toxicity of two homologous series of quaternary ammonium compounds. J. Bact., Baltimore 57 1949 pp. 225-234.
- 844.—Rusconi, C. Nuevo Plesiosauro, pez y langostos del mar jurasico de Mendoza. Rev. Mus. Hist. Nat. Mendoza 2 1948 1-2 pp. 3-12 8 text-figs.
- 845.—Rusconi, C. El Puelchense de Buenos Aires y su fauna (Plioceno Medio) Pt. 1. Publ. Inst. Fis. Geol. Argentina 33 1948 pp. 1-100 figs. 1-31.
- 846.—Rusconi, C. El Puelchense de Buenos Aires y su fauna (Plioceno medio) Pt. 2. Publ. Inst. Fis. Geol. Argentina 36 1949 pp. 100-242 figs. 32-128 pls. 1-17.
- 847.—Rusconi, C. Notas sobre faunas paleozoicas de Mendoza. An. Soc. Cient. argent., Buenos Aires 149 4 1950 pp. 157-177 5 text figs.
- Russert, L. R. *see* Elliott, A. M.
- 848.—Russo, A. Prodotto di alcune tonnare del basso Tirreno nel 1948 e fasi lunari. Boll. Accad. gioenia (4) No. 2 1949 pp. 83-87.
- 849.—Sachs, W. B. Aquarienpflege leicht gemacht. Stuttgart 1950 pp. 1-87 illust.
- 850.—Saint-Seine, P. de. Contributions à l'étude des vertébrés fossiles du Congo Belge. Ann. Mus. Congo belge, (8) Sci. geol. 5 1950 32 pp. 4 figs. 1 pl.
- 851.—Saint-Seine, P. de. La vie dans le chenal de Cerin (Ain) en Jurassique supérieur. C.R. somm. Sé. Soc. Biogéogr., Paris 27 No. 234 1950 pp. 66-69.
- 852.—Saint-Seine, P. de. Les Fossiles au Rendez-vous du Cabcul. Études 263 No. 10 1950 pp. 193-205 9 figs.
- 853.—Saishu, K. On the supplementary scales in fish. Contr. Central Fish. Stat. Japan No. 67 1948 pp. 145-148 figs.
- 854.—Salazar, A. L. Nouvelles données sur le syndrome granulocytaire cyanotannophile. Anat. Anz., Jena 95 1944 pp. 292-310 3 figs.
- Sano, T. *see* Tanii, K.
- 855.—Santos, R. das. *Anaedopogon*, *Chiromystus* e *Ennelichthys* como sinónimos de *Cladocyclus*, da família Chirocentridae. An. Acad. Bras. Cienc. Rio de J. 22 1 1950 pp. 123-138 4 pls.
- 856.—Sanz Echeverria, J. Identificación de los peces de la familia Centrolophidae de España por medio de los otolitos. R. Soc. esp. Hist. Nat. Tomo Extraord. 1946 1949 pp. 151-156 1 pl.
- 857.—Sanz-Echeverria, J. Notas sobre otolitos de peces procedentes de las costas del Sáhara. Segunda parte. Bol. Inst. Esp. Oceanogr. No. 27 1950 pp. 1-14 3 pls.
- Sarangdhar, P. N. *see* Setna, S. B.
- Sarojini, K. K. *see* Pillay, T. V. R.
- 858.—Sartorius, H. Das Moderlieschen (*Leucaspis delineatus*). Deuts. Aquar. Terrar. Z., Stuttgart 3 1950 pp. 69-72 1 text-fig.

- 859.—Satô, M. A comparative observation of the hind-brain of fish possessing barbels, with special reference to their feeding habits. Sci. Rep. Tôhoku Univ. (4) Biol. 16 1941 pp. 157-164 9 figs.
- 860.—Satô, M. Notes on the finger-like pectoral fins in three Japanese fishes. Sci. Rep. Tôhoku Univ. (4) Biol. 17 1 1942 pp. 1-8 6 figs.
- 861.—Saunders, J. T. & Manton, S. M. A manual of practical Vertebrate Morphology. Oxford, 1949.
- 862.—Sawyer, F. E. Through the seasons with a river keeper. XLIV.—"The leader of the shoal." Fishing Gazette, Beckenham (England) 132 1950 p. 820.
- Sayles, L. P. see Walter, H. E.
- 863.—Schaaning, H. T. L. En ny fisk for Rogaland Fylkes fauna. Stavanger Mus. Arshft. 49 1940 pp. 123-124.
- 864.—Schachter, D. Contribution à l'étude écologique de la Carmargue. Le milieu aquatique et sa faune. Ann. Inst. océanogr, Paris 25 1 1950 pp. 1-108 14 figs. tables.
- 865.—Schaefer, M. B. Some recent advances in the study of the biology and racial division of Pacific Tunas. Indo-Pacific Fisheries Council Proceedings 2nd Meeting, Cronulla, N.S.W., April 1950 Bangkok, (F.A.O.) 1950 pp. 63-69 3 figs.
- 866.—Schaefer, M. B. & Reintjes, J. W. Additional records confirming the trans-Pacific distribution of the Pacific saury, *Cololabis saira* (Brevoort). Pacific Sci. Honolulu 4 1950 p. 164.
- 867.—Schaefer, M. B. & Walford, L. A. Biometric comparison between Yellowfin Tunas (*Neothunnus*) of Angola and of the Pacific Coast of Central America. Fish. Bull. U.S. Fish Wildlife Serv. No. 56 1950 pp. 425-443 15 text-figs.
- 868.—Schaeffer, B. & Dunkle, D. H. A semionotid fish from the Chinle formation, with consideration of its relationships. Amer. Mus. Novit. No. 1457 1950 pp. 1-29 6 figs.
- 869.—Schäperclaus, W. Über einen Fall von Flossenfäule beim schwarzen Molly. Wschr. Aquar. Terrarienk., Braunschweig 44 1950 pp. 167-170 5 text-figs.
- Schartau, O. see Montalenti, G.
- Scherrer, J. see Buser, P.
- 870.—Schiemenz, F. Die tierpsychische Bedeutung des Wohnraumes der Fische für die Erhaltung und Nutzung des Fischbestandes. Biol. Zbl., Leipzig 65 1946 pp. 102-108.
- 871.—Schiemenz, F. Elfsket i Tyskland särskilt i Niedersachsen. Svensk Fisk. Tidskr. 59 1950 pp. 26-29 2 text-figs. [not seen.]
- 872.—Schindewolf, O. H. Grundfragen der Paläontologie. Stuttgart 1950 pp. 1-505 text-figs. 1-332 pls. 1-32 (Pisces).
- 873.—Schmidt, U. Die Entwicklung der Hochseutterfischerei in der südlichen Nordsee und ihre Folgen für den Fischbestand. Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart 10 1942 pp. 403-415 8 tabs.
- 874.—Schmidt, W. Über *Listracanthus woltersi* n. sp. und einen anderen neuen Fischrest aus dem tiefsten Westfal B von Prosper 11 bei Bottrop/Westfalen. Z. deuts. geol. Ges. Berlin 101 1 1950 pp. 44-58 text-figs. 1-2.
- 875.—Schmidt, W. J. Über Polarisationsoptik und Feinbau der Deckzellen in der Epidermis von *Petromyzon*. Zool. Anz. 142 1943 pp. 35-41 2 figs.
- 876.—Schmidt, W. J. Das Wesen der Mandlschen Körperchen in den Teleosteerschuppen, ein Beitrag zum Verständnis der Kalkabscheidung bei der Bildung Knochenartiger Gewebe. Z. Naturf. Wiesbaden 2b 1947 pp. 233-238 3 text-figs.
- 877.—Schmitt, W. L. Samuel Frederick Hildebrand August 15, 1883-March 16, 1949. Copeia 1950 p. 1.
- 878.—Schnakenbeck, W. Statistisch-biologische Untersuchungen über die Heringsfischerei. Ber. deutsch. wiss. Kom. Meeresforsch., Stuttgart 10 1942 pp. 369-402 10 figs. 10 tabs. 8 charts.
- 879.—Schnakenbeck, W. Eine akzesorische Rückenflosse beim Stachelrochen (*Raja clavata*). Zool. Anz. 142 1942 pp. 88-90 3 figs.
- 880.—Schnakenbeck, W. Die Entwicklung des Oberflächenpigments bei der Gattung *Salmo*. Zool. Anz. 142 1942 pp. 91-99 9 figs.

881.—Schoffman, R. J. Conservation of fish in Reelfoot Lake, Tennessee. J. Tenn. Acad. Sci. **25** 1950 pp. 65–75.

Schroeder, W. C. *see* Bigelow, H. B.

882.—Schultz, L. P. A further contribution to the ichthyology of Venezuela. Proc. U.S. nat. Mus. **99** 3235 1949 pp. 1–211 3 pls. 20 text-figs.

883.—Schultz, L. P. Samuel Fredrick Hildebrand. Copeia **1950** pp. 2–7 1 fig.

884.—Schultz, L. P. Correction for "A revision of six subfamilies of Atherine fishes with descriptions of new genera and species." Copeia **1950** p. 150.

885.—Schultz, L. P. Notes on the blennioid fish genera *Runula* (Subfamily Petroscleridae) and *Tripterygion* and *Helcogramma* (family Clinidae), of the American Tropical Pacific. J. Wash. Acad. Sci. **40** 1950 pp. 266–268 1 table.

886.—Schultz, L. P. Three new species of fishes of the genus *Cirrhitus* (family Cirrhitidae) from the Indo-Pacific. Proc. U.S. nat. Mus. **100** 1950 pp. 547–552 1 pl.

887.—Schultz, L. P. Review of thirteen genera of South American fishes in the subfamilies Cynodontinae, Hepsetinae, and Characinae, with the description of a new *Cyrtocharax*. Studies honoring Trevor Kincaid, edited by M. H. Hatch, Seattle (Univ. Washington Press) 1950 pp. 44–73.

888.—Schultz, L. P. & Green, A. S. Bibliography of Samuel F. Hildebrand. Copeia **1950** pp. 15–18.

889.—Schwier, H. Über die Vererbung des Streifenmusters in der Gattung *Macropodus*. Zool. Anz. **141** 1943 pp. 179–187 4 figs. 4 tabs.

890.—Schwier, H. Vitalitätsuntersuchungen an normalen und albinotischen Makropoden. Zool. Anz. **143** 1943 pp. 33–44 2 figs. 4 tabs.

891.—Seaman, E. A. Notes on the effect of flash flood on stream fish in West Virginia. Copeia **1950** p. 320.

892.—Secondat, M. Influence de l'exercice musculaire sur la capacité pour l'oxygène du sang de la carpe (*Cyprinus carpio* L.). C.R. Acad. Sci. Paris **230** 1950 pp. 1787–1788.

893.—Secondat, N. Influence de l'exercice musculaire sur la valeur de la glycémie de la carpe (*Cyprinus carpio* L.). C.R. Acad. Sci. Paris **231** 1950 pp. 796–797.

894.—Segerstråle, C. Gaddan och abborren i sydfinländska Kustvatten. Skärgårdsboken, Helsingfors 1948 pp. 401–441 31 text-figs.

895.—Segerstråle, C. Om braxens (*Abramis brama* L.) och idens (*Leuciscus idus* L.) tillväxtart i södra Finlands Kustvatten samt i vattnen kring Åland. Memoranda Soc. Fauna fenn. Helsingfors **25** 1950 pp. 156–165 tables.

896.—Segerstråle, C. Fångster av siklöja (*Coregonus albula* L.) i kustvattnen utanför Helsingfors. Memoranda Soc. Fauna fenn. Helsingfors **25** 1950 pp. 165–167.

897.—Segerstråle, C. Sällsynt stor sik (*Coregonus lavaretus* L.) fångad i Kumlinge skärgård. Memoranda Soc. Fauna fenn. Helsingfors **25** 1950 pp. 167–169.

898.—Segerstråle, C. En harr (*Thymallus vulgaris* L.) fångad i Fögeö. Memoranda Soc. Fauna fenn. Helsingfors **25** 1950 pp. 169–170.

899.—Segerstråle, C. Sällsynt stor mört (*Leuciscus rutilus* L.) fångad i Lill = Perna = vik. Memoranda Soc. Fauna fenn. Helsingfors **25** 1950 pp. 170.

900.—Seleuthner, J. Beobachtungen bei der Zucht von *Corydoras paleatus* (Jenyns). Deuts. Aquar. Terrar. Z., Stuttgart **3** 1950 pp. 50–52 5 text-figs.

Sella, M. *see* Nümann, W.

901.—Senft, W. Das Paarungsspiel des *Apistogramma ramirezi* Myers u. Harry. Wschr. Aquar. Terrarien., Braunschweig **44** 1950 pp. 365–367 3 text-figs.

902.—Setna, S. B. First Chandra Kala Hora memorial lecture. Growth of the fishing industry: sidelights on fifteen years' work. Proc. nat. Inst. Sci., India **16** 1950 pp. 207–219 4 pls.

903.—Setna, S. B. & Sarangdhar, P. N. Observations on the development of *Chiloscyllium griseum* M. and H., *Pristis cuspidatus* Lath. and *Rhynchobatus djiddensis* (Forsk.). Rec. Indian Mus., Calcutta **46** 1949 pp. 1–23 1 pl. 8 text-figs.

904.—Setna, S. B. & Sarangdhar, P. N. Description, bionomics and development of *Scoliodon sorrakowah* (Cuvier) Rec. Indian Mus., Calcutta **46** 1949 pp. 25-53 9 text-figs.

905.—Severtzov, A. N. The origin and evolution of lower vertebrates 1948 **4** 397 pp. illust. Moscow.

906.—Shapovalov, L. & Dill, W. A. A check list of the fresh-water and anadromous fishes of California. Calif. Fish Game **36** 1950 pp. 382-391.

907.—Sharov, I. I. Peculiarities in the epidermal structure of Cyclostomi. C.R. Acad. Sci. Moscou N.S. **74** 3 1950 pp. 615-617. [In Russian.]

Shaw, J. S. *see* Pillay, T. V. R.

908.—Shetter, D. S. A brief history of the sea-lamprey problem in Michigan waters. Trans. Amer. Fish. Soc. **76** (1946) 1949 pp. 160-176.

909.—Shetter, D. S. The relationship between the legal-sized trout population and the catch by anglers in portions of two Michigan trout streams. Pap. Mich. Acad. Sci. **34** 1950 pp. 97-107 1 fig. tables.

910.—Shevtchenko, N. A. On the endothelium of the large blood vessels of minnow. C.R. Acad. Sci. Moscou N.S. **70** 1950 pp. 703-705. [In Russian.]

Shimadate, M. *see* Kawajiri, M.

Shindo, S. *see* Murakami, S.

911.—Shipway, B. Notes on the aquatic natural history of the Lower Murchison river. W. Aust. Nat. Perth **2** 1950 pp. 73-77 2 text-figs.

912.—Shmalgausen, I. I. The attachment of the visceral arches to the cranium in fishes. Zool. Journ., Moscow **29** 1950 pp. 435-448 figs. [In Russian.]

913.—Siccardi, E. M. El problema del tiburón en la economía pesquera e industrial. 1st Congr. nac. Pesq. Mar. d. Plata **2** 1950 pp. 121-146 6 figs.

914.—Signeux, J. Notes paléolithologiques. III.—Squalidae fossiles du Sénonien de Sahel-Alma. Bull. Mus. Hist. nat., Paris (2) **22** 2 1950 pp. 315-319 3 figs.

915.—Silas, E. G. On a collection of fish from Travancore. J. Bombay nat. Hist. Soc. **48** 1949 pp. 792-797.

916.—Sirovatskaya, N. I. The influence of low temperature on propagation of *Abramis brama*. C.R. Acad. Sci. Moscou N.S. **72** 1950 pp. 973-976. [In Russian.]

917.—Sisson, R. F. Lake Sunapee's golden trout. Nat. geogr. Mag. **98** 1950 pp. 529-536 14 figs.

918.—Smirnov, A. I. On the spawning periodicity in the pelagic fishes of the Black Sea. C.R. Acad. Sci. Moscou N.S. **70** 1950 pp. 129-132 figs. [In Russian.]

919.—Smirnov, A. I. Significance of the carotinoid pigmentation in the embryo-larval stages of Cyprinoid fishes. C.R. Acad. Sci. Moscou N.S. **73** 1950 pp. 609-612 [In Russian.]

920.—Smith, D. C. & Matthews, S. A. Studies on the thyroid gland of fishes. Yearb. Amer. phil. Soc. **1948** 1949 pp. 131-132.

921.—Smith, J. L. B. Two noteworthy non-marine fishes from South Africa. Ann. Mag. nat. Hist. (12) **3** 1950 pp. 705-710, 2 text-figs.

922.—Smith, J. L. B. *Pomadasys operculare* Playfair, and the South African Seas, Ann. Mag. nat. Hist. (12) **3** 1950 pp. 778-785 3 figs.

923.—Smith, J. L. B. A new Dogfish from South Africa with notes on other Chondrichthyan Fishes. Ann. Mag. nat. Hist. (12) **3** 1950 pp. 878-887 2 figs.

Smith, L. L. *see* Butler, R. L.

924.—Smith, V. Seining for fishes along the Palisades. Nat. Hist. Notes, nat. Hist. Soc. Jamaica No. **43** 1950 pp. 135-143 24 figs.

925.—Smith, W. C. Behaviour of herrings in shoals in the Irish Sea. Challenger Soc., London **2** 20 1948 p. 10. [Abstract.]

Sokolova, N. Y. *see* Nikolski, G. V.

926.—Soong, Min Kong. Fishes of the Malayan padi-fields. III. Keli: cat-fishes. Malayan Nature J. **5** 1950 pp. 88-91 1 pl.

Southward, M. *see* Katz, M.

927.—Speaker, E. B. A fish population study of an artificial lake. Proc. Iowa Acad. Sci. **55** 1948 pp. 437-444 4 figs.

928.—Speciale, L. L'ipofisi dei selaci (ricerche in *Pristiurus melanostomus*). Monit. zool. ital. Firenze **56** Suppl. 1948 pp. 229-231 2 text-figs.

929.—Spjeldnaes, N. On some vertebrate fossils from Gotland, ch. Ark. Min. Geol. **1** 8 1950 pp. 211-218 2 text-figs. 1 pl.

930.—Springer, S. A revision of north American sharks allied to the genus *Carcharhinus*. Amer. Mus. Novit. No. 1451 1950 pp. 1-13.

931.—Springer, S. Natural history notes on the lemon shark, *Negaprion brevirostris*. Texas J. Sci. **2** 1950 pp. 349-359 2 figs.

Springer, S. *see* Baughman, J. L.

Srinivasan, R. *see* Ganapati, S. V.

932.—Stangenberg, M. The variability of the quantitative features in bleak. Zool. Polon. Wrocław **4** 1948 pp. 107-145 1 pl. 11 text-figs.

933.—Starrett, W. C. Distribution of the fishes of Boone County, Iowa, with special reference to the minnows and darters. Amer. midl. Nat. **43** 1950 pp. 112-127 2 text-figs.

934.—Starrett, W. C. Food relationships of the minnows of the Des Moines River, Iowa. Ecology, Lancaster, Pa. **31** 1950 pp. 216-233 3 figs. tables.

935.—Steinitz, H. Contribution to the knowledge of the Blenniidae of the Eastern Mediterranean III. Rev. Fac. Sci. Univ. Istanbul (B) **15** 1950 pp. 60-87 7 text-figs.

936.—Steinmann, P. Ein neues System der mitteleuropäischen Coregonen. Rev. suisse Zool., Genève **57** 1950 pp. 517-525 2 figs.

937.—Stensiö, E. A. La cavité labyrinthique, l'ossification sclérotique et l'orbite de *Jagorina*. In A. George, Science d'Aujourd'hui; Paléontologie et Transformisme, Paris 1950 pp. 9-41 8 text-figs.

938.—Steven, D. M. Carotinoids in the reproductive cycle of the trout *Salmo trutta*. C.R. **13e** Congr. int. Zool. Paris 1948 [1949] pp. 83-84.

939.—Steven, D. M. Some properties of the photoreceptors of the brook lamprey. J. exp. Biol. **27** 1950 pp. 350-364 10 figs.

940.—Steven, G. A. Mackerel migrations in the south-western area. Challenger Soc. London **2** 20 1948 pp. 17-18. [Abstract.]

941.—Steven, G. A. Notes on the Plymouth marine fauna. Pisces. J. Mar. biol. Ass. U.K. **29** 1950 pp. 254-255.

942.—Stokell, G. A freshwater smelt from the Chatham Islands. Rec. Canterbury (N.Z.) Mus. **5** 1949 pp. 205-207 1 pl.

943.—Stokell, G. The numerical characters of five hybrid trout. Rec. Canterbury (N.Z.) Mus. **5** 1949 pp. 209-212.

944.—Stokell, G. A revision of the genus *Paragalaxias*. Rec. Queen Victoria Mus., Launceston **3** 1 1950 pp. 1-4 1 pl.

945.—Stolk, A. The ovarian occlusion apparatus in the viviparous Cyprinodonts *Lebistes reticulatus* Peters and *Xiphophorus helleri* Heckel. Proc. K. ned. Akad. Wet. Amsterdam **53** 1950 pp. 526-530 3 text-figs.

946.—Strand, E. In Miscellanea nomenclatorica. X. Folia zool. hydrobiol. Riga **11** 1942 pp. 400-401.

947.—Strawinski, S. The development of the liver vessels of the sea-trout *Salmo trutta* L. Bull. int. Acad. Cracovie **1949** BII 1950 pp. 435-446 5 figs.

Strickland, R. R. *see* Herald, E. S.

948.—Striegnitz, H. J. Aufbau und Konstruktion weiterer Lungenfischzähne. Anat. Anz., Jena **96** 1947 pp. 166-182 17 figs.

Stroganov, N. S. *see* Alpatov, V. V.

949.—Stuart, T. A. Brown trout in Highland streams. Challenger Soc. London **3** 2 1950 p. 19. [Abstract.]

Subramanian, S. *see* Chacko, P. I.

950.—Svårdson, G. Chromosome studies on Salmonidae. Rep. Inst. Freshwater Res. Drottningholm **23** 1945 pp. 1-151 4 pls. 23 text-figs.

951.—Svårdson, G. The Coregonid problem. 1. Some general aspects of the problem. Rep. Inst. Freshwater Res. Drottningholm **29** 1949 pp. 89-101 3 text-figs.

- 952.—Svärdson, G. Note on spawning habits of *Leuciscus erythrophthalmus* (L.), *Abramis brama* (L.) and *Esox lucius* L. Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 102–107.
- 953.—Svärdson, G. Competition between trout and char (*Salmo trutta* and *S. alpinus*). Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 108–111 2 text-figs.
- 954.—Svärdson, G. Salmon (*Salmo salar* L.) with no adipose fin. Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 112–114 1 text-fig.
- 955.—Svärdson, G. Natural selection and egg number in fish. Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 115–122.
- 956.—Svärdson, G. Sex differentiation in eel (*Anguilla anguilla*) and occurrence of male eels in the Baltic. Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 123–128.
- 957.—Svärdson, G. Eels (*Anguilla anguilla*) found in Sweden in partial nuptial dress. Rep. Inst. Freshwater Res. Drottningholm 29 1949 pp. 129–134 1 pl. 3 text-figs.
- 958.—Svärdson, G. The Coregonid problem. II. Morphology of two Coregonid species in different environments. Rep. Inst. Freshwater Res. Drottningholm 31 1950 pp. 151–162 4 figs. 7 tabs.
- 959.—Svärdson, G. Vad bestämmer fiskars lektid och lekplats? Svensk Fisk. Tidskr. 59 1950 pp. 8–12 1 text-fig.
- 960.—Svetovidov, A. N. On the parallel alterations of some features in Caspian and Black-Sea-Azovian forms of *Časpiatosa caspia*. C.R. Acad. Sci. Moscou N.S. 72 1950 pp. 421–423. [In Russian.]
- 961.—Svetovidov, A. N. Peculiarities in the structure of air-bladder in Clupeidae. C.R. Acad. Sci. Moscou N.S. 74 1950 pp. 643–644 fig. [In Russian.]
- 962.—Svetovidov, A. N. Fish of Iran collected by E. N. Pavlovski. Trav. Inst. Zool. Acad. Sci. U.R.S.S. 8 1949 pp. 859–869. [In Russian.]
- 963.—Takagi, K. On the glossohyal bone of the Gobioid fishes of Japan, with some phylogenetic considerations. Jap. J. Ichthyol., Tokyo 1 1950 pp. 37–52 text-figs. 1–3. [Japanese with English summary.]
- 964.—Takahashi, T. & Kikuchi, T. The chemical constituents in the bone of shark. Contr. Central Fish. Stat. Japan No. 63 1948 pp. 79–81.
- 965.—Takahashi, T. & Yokoyama, W. Chemical study on placoid scale. Contr. Central Fish. Stat. Japan No. 78 1948 pp. 223–226.
- Takai, T. see Matsui, I.
- 966.—Talbot, G. B. A biological study of the effectiveness of the Hell's Gate fishways. Bull. int. Pacific Salmon Fish Comm. No. 3 1950 pp. 1–80 39 text-figs.
- 967.—Taliev, D. N. Serological analysis of several forms of the wild and domesticated carp (*Cyprinus carpio* L.). Trav. Inst. zool. Acad. Sci. U.R.S.S. 8 1946 pp. 43–88 8 text-figs. [Russian, with English summary.]
- 968.—Taliev, D. N. Influence of predators on Cottoidei in Lake Baikal. C.R. Acad. Sci. Moscou N.S. 58 1947 pp. 1509–1512 3 figs. [In Russian.]
- 969.—Tanii, K. & Sano, T. One observation on the fish-culture in the rice-field. Contr. Central Fish. Stat. Japan No. 92 1948 pp. 67–70.
- 970.—Tåning, Å. V. Island Faerø-Området's Kutlinger (Gobiidae). Vidensk. Medd. Dansk. naturh. Foren. 104 1940 pp. 267–282 4 figs. [English résumé.]
- 971.—Tåning, Å. V. Influence of the environment on number of vertebrae in teleostean fishes. Nature, Lond. 165 1950 p. 28 1 text-fig.
- 972.—Tanner, V. M. A new species of *Gila* from Nevada (Cyprinidae.) Gt. Basin Nat. 10 1–4 1950 pp. 31–36 1 fig.
- 973.—Tanzi, B. & Battaglia, B. La fosfatasi alcalina nella ghiandola nidamentale dei Selaci. Rend. Accad. Lincei (8) 6 1949 pp. 747–750 4 text-figs.
- 974.—Tarr, H. L. A. The acid soluble phosphorous compounds of fish skeletal muscle. J. Fish. Res. Board, Canada 7 1950 pp. 608–612.
- 975.—Tauti, M. On the stock of Spring herring in Hokkaido. Contr. Central Fish. Stat. Japan No. 38 1948 pp. 207–209.

976.—Tavolga, W. N. Pattern variability among populations of the Gobiid fish *Bathygobius soporator*. Copeia 1950 pp. 182-194 1 fig. 1 tab.

Taylor, W. R. *see* Bailey, R. M.

977.—Tchang, T. L. List of fishes from Kiangsi. Peking nat. Hist. Bull. 18 1949 pp. 7-10.

978.—Tchang, T. L. The skeleton of *Culter erythropterus*. Peking nat. Hist. Bull. 18 1950 pp. 155-163 1 pl.

979.—Tchang, T. L. The skeleton of *Chimaera phantasma*. Peking nat. Hist. Bull. 19 1950 pp. 49-52 1 pl.

980.—Teixeira e Silva, H. M. Teor em óleo e potencial de vitamina "A" em fígado de peixes teleosteos. Bol. Industr. Animal, S. Paulo N.S. 10 [1950] pp. 65-88 16 graphs.

981.—TeWinkel, L. E. Notes on ovulation, ova, and early development in the smooth dogfish, *Mustelus canis*. Biol. Bull. Woods Hole 99 1950 pp. 474-486 8 figs.

982.—Thomopoulos, T. Ébauche et morphogénèse embryonnaire de la glande thyroïde chez la truite [*Salmo irideus* Gib. et *Salmo trutta* (fario) L.] Arch. Anat. micr. Morp. exp. Paris 38 1949 pp. 216-254 22 text-figs.

983.—Thompson, W. F. The effect of fishing on stocks of halibut in the Pacific. Seattle (Univ. Washington Press) 1950 pp. xii + 60 12 figs.

Timofeyeva, N. A. *see* Nicolukin, N. I.

984.—Toivonen, S. Ein Fall von Unterkopfmissbildung beim Hecht, *Esox lucius* L. Arch. Soc. Zool.-bot. Fenn., Helsinki 4 1950 pp. 115-117 1 text-fig.

985.—Toombs, H. A. & Rixon, A. E. The use of plastics in the "Transfer method" of preparing fossils. Mus. J. Lond. 50 1950 pp. 105-107 pl. xviii.

986.—Tortonese, E. Affinités et position systématique des poissons du genre *Capros*. C.R. 13e Congr. int. Zool. Paris 1948 [1949] pp. 389-390.

987.—Tortonese, E. Studi sui Plagiostomi. II. Evoluzione, corologia e sistemática della famiglia Sphyrnidae (Pesci martello) Boll. Mus. Zool. Torino 2 No. 2 1949-50 pp. 1-39 11 text-figs.

988.—Tortonese, E. Studi sui Plagiostomi. III. La viviparità: un fondamentale carattere biologico degli Squali. Arch. zool. ital., Torino 35 1950 pp. 101-155.

989.—Tortonese, E. Studi sui Plagiostomi. IV. Materiali per una revisione di *Carcharhinus mediterranei*. Boll. Pesca. Piscic. Idrobiol. Roma N.S. 5 1950 pp. 1-19 7 text-figs.

990.—Tortonese, E. A note on the hammerhead shark, *Sphyrna tudes* Val., after a study of the types. Ann. Mag. nat. Hist. (12) 3 1950 pp. 1030-1033.

991.—Tortonese, E. Alcune osservazioni sul volo dei Cipseluri (Pesci volanti). Natura, Milano 41 1-2 1950 pp. 34-36.

992.—Travassos, L. Relatório da excursão do Instituto Oswaldo Cruz ao Rio Paraná (Porto Cabral), em março e abril de 1944. Mem. Inst. Osw. Cruz, Rio de J. 42 1945 pp. 151-165.

993.—Travassos, L. Relatório da excursão realizada no vale do rio Itaúnas, norte do Estado do Espírito Santo, nos meses de Setembro e Outubro de 1944. Mem. Inst. Osw. Cruz, Rio de J. 42 1945 pp. 487-502.

994.—Tretiakov, D. K. Morphology of tench. Trud. Inst. Zool. Akad. Nauk Ukr. RSR. 1 1948 pp. 21-28 fig. [In Ukrainian.]

995.—Trewavas, E. The origin and evolution of the Cichlid fishes of the great African lakes, with special reference to Lake Nyasa. C.R. 13e Congr. int. Zool. Paris 1948 [1949] pp. 365-368.

996.—Trewavas, E. The status of the American mullets, *Mugil brasiliensis* and *M. curema*. Copeia 1950 p. 149.

997.—Trifonova, A. N., Borisovskaya, E. N., Lakiyan, M. H. The critical periods in the embryonic development of Acipenseridae. C.R. Acad. Sci., Moscou N.S. 66 1949 pp. 1005-1008 figs. [In Russian.]

Trusov, V. Z. *see* Nikiforov, N. D.

998.—Tubb, J. A. & Proctor, A. A convenient accessory for the rapid microscopic examination of dry mount objects. J. Council Sci. Industrial Res., Melbourne 14 1941 No. 3 1 page 2 pls.

- Tubb, J. A.** *see* Blackburn, M.
- 999.—Tucker, D. W.** The biology of *Aphanopus carbo* Lowe. Challenger Soc. London **3** 1950 p. 26. [Abstract.]
- 1000.—Turner, C. L.** The skeletal structure of the gonopodium and gonopodial suspensorium of *Anableps anableps*. J. Morph. **86** 1950 pp. 329–365 10 figs.
- 1001.—Tweedie, M. W. F.** Notes on Malayan fresh water fishes. Bull. Raffles Mus., Singapore No. 21 1950 pp. 97–105 2 text-figs.
- 1002.—Tyurin, P. V.** Method for mass counting of fish vertebrae. C.R. Acad. Sci., Moscou N.S. **59** 1948 pp. 1501–1504 2 tables. [In Russian.]
- Ulbricht-Stier, A.** *see* Bückmann, A.
- 1003.—Umali, A. F.** Guide to the classification of fishing gear in the Philippines. Res. Rep. U.S. Fish Wildlife Serv. No. 17 1950 pp. 1–165 53 text figs.
- 1004.—United Nations—Food and Agriculture Organisation.** Report of the F.A.O. Fisheries Mission for Thailand. Washington, D.C. 1949.
- Uno, K.** *see* Fujita, T.
- 1005.—Vaas, K. F.** Iets over de zoetwatervisserij op Java, Borneo en Celebes. Handel. Hydrobiol. Vereen. Amsterdam **8** 1950 pp. 1–20.
- Vall's T.** *see* Massuti, M.
- 1006.—Van Duijn, C.** Making entire preparations of fish embryos. Microscope, Lond. **7** 1949 pp. 136–138 1 text-fig.
- 1007.—van Someren, V. D.** The 'winter check' on trout scales in East Africa. Nature, Lond. **165** 1950 pp. 473–474 1 text-fig.
- 1008.—Vasnetzov, V.** On the question of the role of the mechanism of development in the formation of species. Zool. J., Moscow **26** 1947 pp. 105–108 4 figs.
- 1009.—Vatova, A.** Caratteri di alcune facies bentoniche della Laguna Veneta. Nova Thalassia, Venezia **1** 4 1949 pp. 3–15 1 map.
- 1010.—Veit, O.** Beiträge zur Kenntnis des Kopfes der Wirbeltiere. III. Beobachtungen zur Frühentwicklung des Kopfes von *Petromyzon planeri*. Gegenbaurs Jb. **84** 1939 pp. 86–107 6 figs.
- 1011.—Vernidub, M. F. & Guseva, M. I.** The morphophysiological stages in the development of larval fishes. C.R. Acad. Sci., Moscou N.S. **71** 1950 pp. 585–588. [In Russian.]
- Vestergren, G.** *see* Rendahl, H.
- Vibert, R.** *see* Fontaine, M.
- 1012.—Vilstrup, T.** Studies on a so far unknown cell-type in the lagena of the shark *Acanthias vulgaris*. Acta Anatomica, Basel **8** 1949 pp. 391–398 4 text-figs.
- 1013.—Vilter, V.** Adaption biologique de l'appareil visuel et les structures rétiniennees de la sardine. C.R. Soc. Biol. Paris **144** 1950 pp. 200–203 3 text-figs.
- 1014.—Vivien, J.-H.** Masculinisation des femelles de *Xiphophorus* par action des rayons X. sur la gonade. C.R. Acad. Sci. Paris **231** 1950 pp. 1166–1168 1 fig.
- 1015.—Vladimirov, V. I.** On the systematic position of *Clupeonella delicatula* (Nordmann) from the Black Sea and Azovsk Sea. C.R. Acad. Sci. Moscou N.S. **70** 1950 pp. 125–128. [In Russian.]
- 1016.—Vladykov, V. D.** Quebec lampreys (Petromyzonidae). 1. List of species and their economic importance. Contr. Dept. Fish. Quebec No. 26 1949 pp. 1–67 21 text-figs.
- 1017.—Vladykov, V. D.** Larvae of Eastern American lampreys (Petromyzonidae). I. Species with two dorsal fins. Nat. canad., Québec **77** 1950 pp. 73–95 13 text-figs.
- 1018.—Vladykov, V. D.** Movements of Quebec Shad (*Alosa sapidissima*), as demonstrated by tagging. Nat. canad., Québec **77** 1950 pp. 121–135 4 figs. tables.
- 1019.—Wade, C. B.** Notes on the Philippine frigate mackerels, family Thunnidae, genus *Auxis*. Fish. Bull. U.S. Fish Wildlife Serv. No. 46 1949 pp. 229–240 10 text-figs.
- 1020.—Wade, C. B.** Observations on the spawning of Philippine Tuna. Fish. Bull. U.S. Fish & Wildlife Serv. No. 55 1950 pp. 409–423 3 figs. 9 tabs.

1021.—Wagler, E. Die Lachsartigen (Salmonidae). II. Teil Coregonen. Demoll & Maier. Handb. Binnenfischerei Mitteleuropas 3 pp. 371–501 109 text-figs. Stuttgart, 1941.

1022.—Wales, J. H. California's Fish Screen Program. Calif. Fish Game 34 1948 pp. 45–51 4 figs. 1 map.

1023.—Wales, J. H., Murphey, E. W. & Handley, J. Perforated plate fish screens. Calif. Fish Game 36 1950 pp. 392–403 7 figs.

1024.—Wales, J. H. Swimming speed of the Western Sucker, *Catostomus occidentalis*. Calif. Fish Game 36 1950 pp. 433–434.

1025.—Wales, J. H. Introduction of Kamloops Rainbow Trout into California. Calif. Fish Game 36 1950 p. 437.

Walford, L. A. *see* Schaefer, M. B.

Walker, B. W. *see* McHugh, J. L.

1026.—Walker, E. T. Spawning records of fishes seldom reported from North Carolina waters. Copeia 1950 p. 319.

Wallis, O. L. *see* Hubbs, C. L.

1027.—Walter, H. E. & Sayles, L. P. Biology of the Vertebrates. New York 1949.

1028.—Warfel, H. E. Outlook for development of a tuna industry in the Philippines. Res. Rep. U.S. Fish Wildlife Serv. 28 1950 pp. 1–37 17 text-figs.

1029.—Warfel, H. E. & Clague, J. A. Shark fishing potentialities of the Philippine Seas. Res. Rep. U.S. Fish Wildlife Serv. 15 1950 pp. 1–19 1 fig. 12 tabs.

1030.—Washburn, G. N. The toxicity to warm-water fishes of certain cyanide plating and carburizing salts before and after treatment by the alkalichlorination method. Sewage Works J. (U.S.A.) 20 1948 pp. 1074–1083.

Washburn, G. N. *see* Cooper, G. P.

Washburn, G. N. *see* Dobie, J. R.

1031.—Weinfurter, E. Ueber die Gattung *Soricidens* Münster (Pisces) Anz. Öst. Akad. Wiss. Wien 86 1949 pp. 16–17.

1032.—Weinfurter, E. Eine neue otolithen fauna aus dem Miozän von Mühlendorf in Kärnten. Anz. Öst. Akad. Wiss. Wien 86 1949 pp. 171–173.

1033.—Weisel, G. F. Observations on the Mudsucker, *Gillichthys mirabilis*. Calif. Fish Game 34 1948 p. 81.

1034.—Weisel, G. F. The comparative effects of teleost and beef pituitary on chromatophores of cold-blooded vertebrates. Biol. Bull. Woods Hole 99 1950 pp. 487–496 5 figs. 2 tabs.

1035.—Welikochatko, T. Comen-tarios ao livro de Henry W. Fowler, "Os peixes de agua doce do Brasil." Bol. Industria Animal, S. Paulo N.S. 9 3–4 1947 pp. 60–63.

1036.—Went, A. E. J. Salmon tagging in Ireland in 1948 and 1949. Challenger Soc. London 3 2 1950 pp. 21–22. [Abstract.]

1037.—Went, A. E. J. Oblong sun-fish (*Orthogoriscus truncatus* Day) seen off the Fastnet Rock on 17th May, 1949. Irish Nat. J. Belfast 10 1950 pp. 16–17.

1038.—Went, A. E. J. Salmon of the River Shannon in 1946 and 1947. J. Conseil, Copenh. 16 1950 pp. 341–357 18 tabs. 2 figs.

1039.—Went, A. E. J. Recent Irish records of rare fish. Nature, Lond. 165 1950 p. 1025.

1040.—Went, A. E. J. Fish culture in Ireland. Salmon Trout Mag., Lond. No. 129 1950 pp. 119–130.

Westlake, E. F. *see* Lachner, E. A.

1041.—Westoll, T. S. Evolutionary trends in the Dipnoi. C.R. 13e Congr. int. Zool. Paris 1948 [1949] pp. 513–516.

1042.—Westoll, T. S. On the evolution of the Dipnoi. Jepson, G. L., Mayr, E. & Simpson, G. G. Genetics, Paleont. & Evol. Princeton, N. J. 1949 pp. 121–184 11 figs. tables.

1043.—White, E. I. The vertebrate faunas of the Lower Old Red Sandstone of the Welsh Borders. Bull. Brit. Mus. (Nat. Hist.), Geol. 1 3 1950 pp. 49–67 2 text-figs.

1044.—White, E. I. *Pteraspis leathensis* White, a Dittonian zone-fossil. Bull. Brit. Mus. (Nat. Hist.) Geol. 1 3 1950 pp. 69–89 25 text-figs. pl. v.

1045.—White, E. I. A fish from the Bunter near Kidderminster. Trans. Worcestersh. Nat. Cl. 10 3 1950 pp. 185–189 1 text-fig.

1046.—Whitley, G. P. A list of the fishes of Western Australia. *Fish. Bull. W. Aust.* No. 2 1948 pp. 1-35 1 map.

1047.—Whitley, G. P. Studies in ichthyology No. 13. *Rec. Aust. Mus. Sydney* 22 1 1948 pp. 70-94 11 figs.

1048.—Whitley, G. P. The handfish. *Aust. Mus. Mag. Sydney* 9 1949 pp. 398-403 9 text-figs.

1049.—Whitley, G. P. Butterfly cod. *Aust. Mus. Mag. Sydney* 10 1950 pp. 41-46 6 figs.

1050.—Whitley, G. P. The Opah or Moonfish in Australasia. *Aust. Mus. Mag. Sydney* 10 1950 pp. 76-78 1 fig.

1051.—Whitley, G. P. Clingfishes. *Aust. Mus. Mag. Sydney* 10 1950 pp. 124-128 4 figs.

1052.—Whitley, G. P. A large Star-gazer. *Aust. Mus. Mag. Sydney* 10 1950 p. 135 1 fig.

1053.—Whitley, G. P. Development of a Port Jackson shark. *Proc. R. Zool. Soc. N.S.W.* [1948-49] 1950 p. 28.

1054.—Whitley, G. P. Some rare Australian fishes. *Proc. R. Zool. Soc. N.S.W.* [1948-49] 1950 pp. 32-34 5 text-figs.

1055.—Whitley, G. P. A new shark from north-western Australia. *West. Aust. Nat.* 2 1950 pp. 100-105 2 figs.

1056.—Wiborg, K. F. The occurrence of fish eggs and larvae along the coast of Northern Norway during April-June 1948 and 1949. *Ann. Biol. Copenh.* 6 1949 [1950] pp. 12-16 14 figs.

1057.—Wiborg, K. F. The food of cod (*Gadus callarias* L.) of the O-II-group from deep water in some fjords of northern Norway. *Fiskeridir. Skrift. Havundersøk.*, Bergen 9 8 1950 pp. 1-25 7 text-figs.

1058.—Willem, V. Contributions a l'étude des organes respiratoires chez les téléostéens: *Lophius* et *Chirolophius*. *Bull. Mus. Hist. nat. Belg.* 26 No. 20 1950 pp. 1-11 7 figs.

1059.—Willem, V. Contributions a l'étude des organes respiratoires chez les téléostéens: *Dibranchius*. *Bull. Mus. Hist. nat. Belg.* 26 No. 22 1950 pp. 1-5 3 figs.

1060.—Willem, V. Contributions a l'étude des organes respiratoires chez les téléostéens: *Chaunax*. *Bull. Mus.*

Hist. nat. Belg. 26 No. 31 1950 pp. 1-4 2 figs.

1061.—Williams, W. Clown fish. *Nat. Hist., N.Y.* 59 1950 pp. 208-210 3 figs.

1062.—Wilson, J. A. A Platysomid from the Double Mountain Group of Texas. *J. Paleont. Menasha, Wis.* 24 1950 pp. 386-388 figs. 1-2.

1063.—Woker, H. & Wuhrmann, K. Die Empfindlichkeit verschiedener Fischarten gegenüber Ammoniak, Blausäure und Phenol. *Rev. suisse Zool., Genève* 57 1950 pp. 548-553 1 fig. 1 tab.

1064.—Wolf, Ph. Fiskeribiologiska undersökningar i Kävlingeån. (Fishes biological investigations in the Kävlinge River) Lund, (C.W.K. Gleerup) 1950 pp. 72, 10 diagrs, 2 pls. [English summary.]

1065.—Wolf, Ph. American problems and practice. I. Salmon which disappeared. *Salmon & Trout Mag.* No. 130 1950 pp. 201-212.

Woodhull, C. A. *see* Calhoun, A. J.

1066.—Worden, A. N. The U.F.A.W. Handbook on the care and management of laboratory animals. London, 1949.

1067.—Worthington, E. B. An experiment with populations of fish in Windermere 1939-148. *Proc. zool. Soc. Lond.* 120 1950 pp. 113-149 8 text-figs.

Wojnárovich, E. *see* Entz, B.

Wuhrmann, K. *see* Woker, H.

1068.—Wunder, W. Ein Leistungsprüfungsversuch mit Karpfen in der Niederlausitz. *Arch. Hydrobiol. Stuttgart* 43 1 1949 pp. 142-155 4 text-figs.

1069.—Wunder, W. Wirbelsäulenverkürzung als rassenbildendes Merkmal beim Aischgründer Karpfen. Remane and others, *Verh. Deuts. Zool. in Kiel* 1948, Leipzig (Geest & Portig) 1949 pp. 294-297.

1070.—Wunder, W. Wundheilung, Regeneration und Parasitenabwehr bei Fischen. *Herre. Verh. Deuts. Zoologen in Mainz* 1949 Leipzig (Geest & Portig) 1950 pp. 135-137.

1071.—Wunder, W. Doppelbildung der Rückenflosse der Bauchflossen und der Gallenblase nach einer Schnittverletzung beim Karpfen. *Roux Arch. Entw. Mech. Org.* 144 1950 pp. 358-363 3 figs.

1072.—Wunder, W. Verdoppelung und Verdreifachung der Enden der Kiemenblättchen beim Karpfen. Zool. Anz. **145** 1950 pp. 225–230 2 figs.

1073.—Wunnenberg, C. Zur Ausbildung des Posidonienschiefers in der Umgebung von Braunschweige mit besonderer Berücksichtigung der Fossilisation. N. Jahrb. Geol. Paläont. Stuttgart **1950** pp. 146–182 (Pisces 163–170).

1074.—Yanamoto, T. On the number of ripe ovarian eggs of the pond smelt, *Hypomesus olidus* (Pallas). Contr. Central Fish. Stat. Japan No. 31 1948 pp. 150–152.

1075.—Yañez, A. P. La exploracion cientifica del mar Chileno. I. El viaje de la corbeta italiana "Magenta." Rev. Biol. Marin. Valparaiso **1** 1948 pp. 132–162 2 text-figs.

1076.—Yañez, A. P. Sobre la presencia de *Cetorhinus maximus* (Gunner, 1765), en los mares chilenos. Rev. Biol. Marin. Valparaiso **1** 1949 pp. 233–235 1 fig.

1077.—Yasvoin, J. V. Structure and reduction of dentine in some Teleostei (*Anarrichas lupus* and *Salmo fario*) C.R. Acad. Sci. Moscou N.S. **74** 1950 pp. 815–817. [In Russian.]

Yatsunagi, K. *see* Fujita, T.

Yokoyama, W. *see* Takahashi, T.

1078.—Yondayev, N. A. On the β alanine in the muscular tissue of rabbits on different stages of ontogenesis, and in the muscles of some fishes. C.R. Acad. Sci. Moscou N.S. **71** 1950 pp. 717–720 figs. [In Russian.]

Young, P. H. *see* Fitch, J. E.

1079.—Young, J. Z. The life of Vertebrates. Oxford (Clarendon Press) 1950 pp. xvi + 767 497 figs.

1080.—Young, P. H. Netting bait and cannery fish with the aid of lights. Calif. Fish Game **36** 1950 pp. 380–381.

1081.—Yudkin, I. I. Infiltration of herrings into the Karsk Sea and into the other arctic regions in connection with climatic fluctuations. C.R. Acad. Sci. Moscou N.S. **58** 1947 pp. 2085–2087. [In Russian.]

1082.—Zandt, F. Zur Biologie des Blaufelchens (*Coregonus wartmanni* Bl.) des Bodensees. Arch. Hydrobiol., Stuttgart **43** 1950 pp. 459–496 17 text-figs.

II.—SUBJECT INDEX

GENERAL

Text books.—Practical vertebrate morphology, SAUNDERS & MANTON **861**; Biology of vertebrates, WALTER & SAYLES **1027**; Life of Vertebrates, YOUNG **1079**; vertebrate hormones, BUDDENBROCK **134**; Palaeontology, SCHINDEWOLF **872**.

Popular books.—Care of the aquarium (in German), SACHS **849**.

Biography and bibliography.—Bibliography of literature on breeding habits of Indian freshwater fishes, JONES **502**; of animal venoms, HARMON & POLLARD **403**; of "Magenta" voyage, YANEZ **1075**; of S. F. Hildebrand, SCHULTZ & GREEN **888**; obituary of S. F. Hildebrand, HIGGINS **432**; HUBBS **455**; SCHMITT **877**; SCHULTZ **883**.

Historical.—Obsolescent fishing methods in Morecambe Bay, England, JOHNSON **495**; accounts of hand fishing GUDGER **377, 380**; discovery of spiral valve, GUDGER **382**; propagation of *Salmo* in Ireland in 19th century, WENT **1040**; goldfish of China in XVIII century, HERVEY **426**; historical notes on *Muraena*, LATIL **583**.

Expeditions and Collections.—Station records of Crocker-Stanford expedition 1938, BOLIN & MYERS **112**; notes on "Magenta" voyage, YANEZ **1075**; catalogue of types of Monaco Museum, BELLOC **82**.

Museum Collections.—Fish exhibition in museums, ABELLA DE LOPEZ **7**.

Technique.—Of sampling with gill-nets, MOYLE **698**; methods of trapping and netting fish in Windermere, WORTHINGTON **1067**; methods of discovering marine fish shoals, BORISOV **115**; mass-counting of fish vertebrae, TYURIN **1002**; review of methods of assessment of food of fishes, HYNES **467**; thermocouple harpoon for measuring body temperature, MORROW & MAURO **696**; method of examining the regulating system of oxydative metabolism, DOHRN & REIN **257**; method for determining age composition, KETCHEN **541**; removal and interpretation of otoliths, JONES & HYNES **498**; use of bones, excluding otoliths, for determining age and growth-rate, MENON **660**; method of making entire preparations of em-

bryos, VAN DUJN 1006; of rearing marine fish in laboratory, MCHUGH & WALKER 619; making a simple otolith cutter, PERRYMAN 774; methods of tagging, GNERI 358; use of check tag for marking fish, CABLE 146; tagging *Clupea*, FRIDRIKSSON & AASEN 329; tagging *Alosa*, VLADYKOV 1018.

ECONOMICS

Fishery research.—Plankton and fishery biology, HENTSCHEL 419; use of echo sounding in pelagic fisheries, HODGSON 435; mathematical study of some Spanish migratory food fishes, ANADON 29; Herring marking in European waters, FRIDRIKSSON 327.

Overfishing.—Effect on stocks of *Microstomus*, RAE 812; effect of war years on fish stocks, MERLE 663; effect of fishing on productivity of halibut stock in Pacific, THOMPSON 983; depletion caused by overfishing in East Australian waters, FAIRBRIDGE 277.

Exploitation.—Experiments with lakes empty of fish, ALM 20.

Conservation.—Of *Mugil* in W. Australia, KESTIVEN 537.

Effects on fishes of industrial effluents.—Effect of pollutional wastes on fish and fisheries, HALME 391; effect of sewage, CROSS 219; mortality caused by drainage water from lignite pit, LARSEN & OLSEN 581; effects of pollution in Swedish waters, WOLF 1064; pollutional effects of effluents on Cauvery river fisheries, GANAPATI & ALIKUNHI 340, 343; treatment of effluents containing cyanide salts to reduce toxicity to fish, WASHBURN 1030; effect of wood fibre pollution on population of *Coregonus*, JOHANSON 493.

Dams and other obstructions affecting fishery.—Effect of Lower Bhavani project on fisheries, CHACKO & DINAMANI 180; of Tungabhadra project, CHACKO & MATHEWS 190; of Ramapadasagar project, CHACKO 176; effect of headwater impoundment, CROSS 219; effect of Moricetown falls on spawning of *Salmo*, MILNE 671; effect of obstruction on *Oncorhynchus* at Hell's Gate, TALBOT 966; effect of Delta cross channel works on reproduction of *Roccus*, CALHOUN & WOODHULL 149; use of denil fishway in Des Moines river, HARRISON 407.

Pisciculture and fish management.—In Krishna river, Madras, CHACKO 177; attempts to re-stock the Käylinge river, WOLF 1064; pisciculture in Mexico, ALVAREZ 24; experiment on fish populations in Windermere, WORTHINGTON 1067; propagation of several species of N. American small fresh-water fishes, DOBIE, MEEHEAN & WASHBURN 256; freshwater farming in Malay Archipelago, GOPINATH 363; fish farming of reservoirs in Kamishin, Stalingrad, Russia, NIKOLSKI & SOKOLOVA 739; the production and cropping of fresh waters, ALLEN 15; culture of fry in hard water, MOOKERJEE & BHATTACHARYA 684; acclimatization of post larval marine fish to freshwater, GANAPATI & ALIKUNHI 339; marine fish cultivation, GROSS 371; fish cultivation experiment in Kyle Scottish, RAYMONT 822; propagation of fish in the Black Sea, PAVLOVSKAYA 771; efficacy of chemical fertilizers, BALL 58; fertilization of a sea-loch, GROSS 372; rearing fish larvae, DANNEVIG & DANNEVIG 225; treatment of disease in hatchery; RUCKER, JOHNSON & ERLING 843; effect on fishes of underwater explosions, PUKE 804; plants and invertebrate fauna of a moorland fishpond, MACAN 616; Iowa fisheries programme, CARLANDER 154; checking the fish population of an Iowa lake, SPEAKER 927; study of fishes of Storm Lake, Iowa, ROSE 840; creel census data on two S. Iowa lakes, LEWIS 598; survey of three Piedmont reservoirs, HUESKE 461; creel census of L. Mendota, MACKENTHUN & HERMAN 620; report on fishes of Reelfoot lake, SCHOFFMAN 881; tagging studies in TVA reservoirs, MANGES 628; fish catch in some Tennessee lakes, CHANCE 192; use of fine-mesh nylon nets for surveys, MOORE 689; fish screening, WALES 1022, 1023; application of population concepts to fish-management, MOYLE 699; problems of fish management and changes in abundance of stock, BLACKBURN 101; dynamics of fish shoal and productivity of the water reservoir, NIKOLSKI 738; balance of species and differential fishing pressure in stocked lakes; MOYLE, KUEHN & BURROWS 700; Variations in size and composition of populations in newly stocked ponds, KREUMHOLZ 566; estimation of populations in small ponds, FREDIN 325; statistical data on fish culture in W. Java, HOFSTEDE & ARDIWINATA 440;

use of scale readings in fish management, BINKLEY 97; catching fishes by hand, HORA 451; ecology and management of a lake stocked with *Salmo gairdnerii* kamloops, LARKIN, ANDERSON, CLEMENS & MACKAY 579; relation between trout population and catch, SHETTER 909; loss of *Salmo* fry due to predators, HULT & JOHNELS 464; use of salmon parr for fertilizing eggs, ALM 17; *Salvelinus* of L. Sunapee (photographs), Sisson 917; food competition between *Salmo trutta* and *Salvelinus alpinus* with relative survival rates, SVÄRDSON 953; prevention of growth of water-mould on *Osmerus* eggs, NAKAMURA 717; artificial breeding of *Osmerus*, NAKAMURA 716; *Cyprinus carpio*, interbreeding of European domesticated varieties with Japanese, MATSUI 645; culture of *Cyprinus* in Brazil, MACHADO 618; in Japan, MATSUI 646; use of artificially mixed food in carp culture, KOYAMA 559; nitrogen and phosphorus content of water necessary for carp culture, TANI & SANO 969; differences of weight in *Cyprinus* due to favourable and unfavourable conditions, WUNDER 1068; attempt to induce spawning in *Ctenopharyngodon*, KAWAMOTO 529; cultivation of *Plecoglossus*, KAWAZIRI 533; survival in ponds after spawning of male and female *Plecoglossus* together and separately and in different conditions of temperature, MATSUI 643; notes on breeding of *Cichla*, FONTENELE 303; growth of Pleuronectids in a fertilized sea-loch, GROSS 373.

Fishes useful or harmful to man.—Lampreys of Quebec, VLADYKOV 1016; *Gobioides* burrowing in rice fields; CLOWES 205; *Echeneis* used for fishing, BERRILL 90.

Methods of fishing.—Primitive fishing techniques in China, CHOW 197; fishing by suction-pipe combined with alternating electric currents, CHERNIGIN 195.

Poisonous fishes.—refs. to, HARMON & POLLARD 403; *Trachinus*, DATHE 230; poisoning due to ingestion of *Gymnothorax*, KHELENTZOS 542; effect of wound from *Heterostichus*, HALSTEAD & MODGLIN 393.

Fishes and malaria control.—*Tilapia* in Java, HOFSTEDE & BOTKE 441.

Fishes as test animals.—Toxic effect of $AlCl_3$ on some fishes, PULLEY 806.

Undeveloped fishery resources.—Of S. W. Madagascar, ANGOT 39; tuna fishery in Philippines, WARFEL 1028.

Fisheries of—West Greenland, early 19th cent., JENSEN 491; Outer Hebrides, HANCE 396; Northern Ireland (*Anguilla*), FROST 331; Cornwall (*Sardina*), HOGSDON & RICHARDSON 436; Denmark (*Clupea*), POULSEN 796; L. Constance (*Coregonus*), ZANDT 1082; Castellón (sardine), ANDREU, RODRIGUEZ-RODA & LARRANETA 38; Malaga, BEL-LON 84, 85; Porto Novo, CHACKO 175; Lower Ogun river, Nigeria, MACLAREN 623; U.S.A. (statistics for 1946-47), ANDERSON & POWER 34; California (sardine), CLARK & DAUGHERTY 202; California (shark), PHILLIPS 781; ROEDEL & RIPLEY 837; Caribbean (statistical tables), CARIBBEAN COMMISSION 152; India (growth of fishing industry), SETNA 902; India (freshwater), PILLAY & SHAW 785; Thailand 1004; Malaya, GOPINATH 362; KESTEVEN ET AL 539; freshwater fisheries of Java, Borneo and Celebes, VAAS 1005; Philippines (shark), WARFEL & CLAGUE 1029; Philippines (classified list of fishing gear), UMALI 1003; Australia (*Thyrsites*), BLACKBURN 103 & 105; S. E. Australia, BLACKBURN & TUBB 106.

STRUCTURE

General.—Of *Cetorhinus*, MATTHEWS & PARKER 651; of *Thunnus thynnus* and *T. maccoyii*, GODSIL & HOLMBERG 359; of Japanese Scopaenoids, MATSUBARA 639; of *Ceratias*, CLARKE 204; eggs, Fossil (Cretaceous) BROWN 129.

Tegumentary system.—Macroscopic structure of scales of some fishes of Manchuria, MATSUI 647; supplementary scales, SAISHU 853; epidermis of Cyclostomi, SHAROV 907; epidermis of *Petromyzon*, SCHMIDT 875; epidermal adhesive organs of *Glyptocheilichthys*, BHATIA 94; scales of *Gadus*, SCHMIDT 876; scales of *Glossogobius*, MOOKERJEE 688.

Fins.—Differences in form of membranous border of unpaired fins, MOHR 676; types of caudal fin, AFFLECK 9; morphological convergence of fin spines in Labridae and Siluridae, BLANC 108; Fin-equipment of *Pelecus* and other hatchet-shaped fishes; RAUTHER 820; gonopodium and its suspensorium in

Anableps, TURNER 1000; pectoral fins of *Lepidotrigla*, *Apistus* and *Inimicus*, SATO 860; lure of *Ceratias*, CLARKE 204; RAUTHER 819.

Skeleton.—KLAAUW 548; of *Chimaera* TCHANG 979; of *Culter*, TCHANG 978; of *Kaupichthys*, GOSLINE 367; neurocranium of *Gadus*, FORD 304; chondrocranium of *Notopterus*, OMARKHAN 755; skull of *Tinca*, TRETIAKOV 994; of *Percichthys*, MACDONAGH 617; of African Characidae, MONOD 681; a mandibular groove for replacement teeth, MONOD 681; glossohyal bone of some Gobioidae, TAKAGI 963; attachment of pharyngobranchials, SHMALGAUSEN 912; branchiostyles of some teleosts, MONOD 680; structure of bones and teeth in *Megalichthys*, BISTROV 99.

Dentition.—Of African Characidae, with replacement and other unerupted teeth, MONOD 681; teeth of *Anarrichas lupus* and *Salmo fario*, YASVOIN 1077; of Dipnoans, STRIEGNITZ 948.

Nervous system.—Peripheral nervous system of Teleosts, KIRSCH 545; optic root in some teleosts, LEHISSA 588; postoptic commissures of teleosts, MAZZI 654; an undescribed nucleus in meso-diencephalus of teleosts, MAZZI 653; choroid membrane of *Leuciscus*, CORDIER 214; autonomic system of *Hydrolagus*, NICOL 731 & 732; macroscopic structure of hind-brain of fishes possessing barbels, SATO 859.

Sense organs.—Cutaneous sense organs, MOORE 690; the eye, DETWILER 239; the nucleus in retort-shaped, visual cell of Teleostei, BABURINA 46; of retina in *Clupea*, VILTER 1013; eye & labyrinth cavity of *Jagorina*, STENSIÖ 937; labyrinth of *Pristiophorus*, ISELSTÖGER 473; of *Rhinobatus*, ISELSTÖGER 474; new cell type in lagena of *Acanthias*, VILSTRUP 1012; otoliths of some Cyprinodonts, AHRENS 10; of *Ammodytes*, KÄNDLER 517.

Muscles.—Histology of red and white muscles, KRÜGER 565; lateral muscles of some teleosts, MASER 635; Pectoral musculature in *Pelecus* and other fishes, RAUTHER 820; hypopharyngeal protractor muscle of *Chascanopsetta*, CHABANAUD 171.

Lateral line system.—Head lines of *Kaupichthys*, GOSLINE 367; of Soleidae in relation to asymmetry, CHABANAUD 166.

Digestive system.—Of *Psettodes* and *Atheresthes*, CHABANAUD 159; spiral valve, its history and discovery, GUDGER 382.

Excretory organs.—Pronephros of *Myxine*, HOLMGREN 446; effect of alloxan on kidney of *Lebistes*, GROSSO 376.

Air bladder.—Of some deep sea fishes, MARSHALL 632; of Clupeidae, SVETOVDOV 961; in young stages of *Macropodus*, PETERS 777.

Glands.—Luminous organ of indirect emission, HANEDA 398; alkaline phosphatase in nidamental gland of Selachians, TANZI & BATTAGLIA 973; hypophysis of *Pristiurus*, SPECIALE 928; a buccal gland in *Alestes*, MONOD 681; normal pancreas of *Lebistes* and effect on it of alloxan, GROSSO 376; poison glands of *Trachinus*, DATHE 230.

Venomous organs.—Sting of *Holo rhinus*, HALSTEAD & MODGLIN 393.

Respiratory system.—Of marine teleosts, HENSCHER 417; branchial apparatus of *Lampetra*, ROBERTS 833; pseudobranch of normal and blind *Carassius*, RAUTHER 818; respiratory apparatus of *Lophius* and *Chirolophius*, WILLEM 1058; *Dibranchius*, WILLEM 1059; of *Chaunax*, WILLEM 1060.

Vascular system.—Endothelium of blood vessels of *Lampetra*, SHEVTCHENKO 910; blood of *Myxine*, HOLMGREN 446; internal carotid arteries in *Squalus*, HARRIS 406; blood vascular system of *Anguilla*, MOTT 697; blood cells of *Ophicephalus*, DHAR 245; coronary arteries of *Lepidosiren* and *Protopterus*, FOXON 314.

Reproductive system.—Of *Cetorhinus*, MATTHEWS 650; of *Sebastes*, KOTTHAUS 558; yolk-sac placenta of *Scoliodon*, SETNA & SARANGDHAR 904; placenta and umbilical cord of *Scoliodon*, *Paragaleus* and *Carcharinus*, BUDKER 135; gonads of *Polyodon*, LARIMORE 578; of hermaphrodite *Sparus*, ANCONA 32; PASQUALI 769; ovaries of *Polynemus*, KARANDIKAR & PALEKAR 523 & 524; spermatozoa of *Salmo* spp., RÖTHEL & ROTH 842; sperm cells of *Gambusia*, MEDLEN 655; occlusion apparatus in *Lebistes* and *Xiphophorus*, STOLK 945; pectoral clasper of *Xenodexia*, HUBBS 456.

Comparative morphology.—Comparative anatomy of larynx, NEGUS 723; of vertebrate excretory system, FRASER 317; of functional components of skull, KLAUW 547; comparative size of liver and spleen in vertebrates, GARVEN 347; the selachian brain, GERLACH 350; labyrinth organ in fishes, ISELSTÖGER 472; types of suspensorium in fishes, HOFER 439; functional morphology, MALDONADO-KOERDELL 624.

Teratology and pathology.—Teratological embryos of *Salmo*, CZOPEK 221; abnormal vertebral column in *Gadus*, FOREST 305; vertebral shortening and fusion of vertebrae in *Cyprinus*, WUNDER 1069; bone softening and twisting of vertebrae in *Cyprinus* after dropsy, MANN 630; malformation in head of *Esox*, TOIVONEN 984; an accessory dorsal fin in *Raia*, SCHNAKENBECK 879; duplication of dorsal fin and of gall-bladder in *Cyprinus* due to injury, WUNDER 1071; double tailed *Xiphophorus*, COATES 206; blind *Pteraspis* from L. Old Red Sandstone, WHITE 1044; fibroplastic sarcoma, HOSHINA 453.

DEVELOPMENT

General.—Of bones of skull roof in *Dipterus*, PANINGTON 766; fate of neural crest in *Lampetra*, NEWTH 727; early developmental stages in *Mustelus*, TEWINKEL 981; *Hilsa*, JONES & MENON 504; KULKARNI 568; *Labeo gonius*, MOOKERJEE & GANGULY 685; *Perca*, LASKAR 582; *Platichthys*, ORCUTT 759.

Experimental embryology.—Investigations on gastrulation in *Scyliorhinus*, KOPSCH 553; action of hypertonic solutions on egg of *Salmo*, DEVILLERS 243; morphogenetic role of cortex in egg of *Salmo*, DEVILLERS 240; vital staining of periderm in the embryos of *Misgurnus*, MOORTAZI 695; observations on *Fundulus* embryos, OPPENHEIMER 756; development of flatfish eggs in diluted North Sea water compared with those under normal conditions, MARX & HENSCHEL 634.

Physiology of development.—Forces concerned in epiboly during gastrulation, DEVILLERS 244; critical stages in physiological development of larval *Coregonus*, OLIPHAN 746.

Eggs.—Of *Setipinna*, JONES & MENON 503; of *Ophicephalus*, MOOKERJEE, GANGULY & BHATTACHARYA 686; of some eels from Gulf of Manaar, NAIR & BHIMACHAR 714; egg-cases of *Chiloscyllium*, SETNA & SARANGDHAR 903; descriptions of Rajid egg-cases; ISHIYAWA 476; experiments with eggs of Acipenseridae, TRIFONOVA, BORISOVSKAYA & ZAKIYAN 997; maturation and cleavage induced by pituitary; KAWAMURA & MOTONAGA 530.

Embryos.—Of *Pristis* and *Rhynchobatus*, SETNA & SARANGDHAR 903; of *Scoliodon*, SETNA & SARANGDHAR 904; of some *Pleurotremata*, TORTONESE 988.

Larvae and Young.—Of *Labeo*, ALIKUNHI ET AL 12; of *Gobiopertus*, PILLAY & SAROJINI 784; of some eels from Gulf of Manaar, NAIR & BHIMACHAR 714; morpho-physiological stages in development of larval fishes, VERNIDUB & GUZEVA 1011.

Metamorphosis.—Of *Lampetra mariae*, BALABAI 57; of *Elops* and *Megalops*, ALIKUNHI & RAO 14; of *Albula*, FITCH 290; changes in dermal connective tissue of head of *Petromyzon*, JOHNELS 494.

Organogeny and histogenesis.—Experiments on influence of temperature at critical period on number of vertebrae, TÄNING 971; relationship of dermal bones with lateral line system, DEVILLERS 242; sensory lines of cheek, HOLMGREN 445; trabecula of cranium, DE BEER 233; excretory system, FRASER 317; vascular system of liver, STRAWSKI 947; mesodermal enamel of teeth, KVAM 572; histogenesis of dental enamel in Selachians, LISON 604; experimental study of the formation of fins in Teleostei, LOPASHOV 607; caudal fin of some teleosts, AFFLECK 9; head of *Petromyzon*, VEIT 1010; thyroid of *Salmo*, THOMOPOULOS 982; retina of *Hemiculter leucisculus*, BABURINA 47; chondrocranium of *Notopterus*, OMAR-KHAN 755; variations in pancreas of *Hemichromis* during development, EBEL-ROTHE 264; hydrostatic organ in young *Macropodus*, PETERS 777.

Effect of external factors.—On development of *Lucioperca*, ENTZ & WOYNÁROVICH 270.

Regeneration.—In some Mediterranean fishes, BUSER 141; of muscles in fish, LITVER 605; regeneration and heal-

ing of wounds in fishes, WUNDER 1070 ; effect of hypophysectomy on regeneration, BUSER 142 ; inhibiting action of pregneninolone on fin regeneration, BUSER 140 ; experiments on regeneration of the skin in *Lampetra*, ORLOVA 761 ; of muscles in *Lampetra*, ORLOVA 762 ; gill lamellae in *Cyprinus*, WUNDER 1072 ; nerve fibres in developing *Lebistes*, KIRSCH 546 ; barbel in *Ictalurus*, NEILL 726.

Allometric growth.—pectoral fins of young *Mullus*, BOUGIS 119 ; in *Ceratias*, CLARKE 204.

Abnormal.—Abnormal development of sexual apparatus of *Scyliorhinus*, ARTHUR 41.

Osmotic relations.—Do fresh-water fishes swallow water ? ; FRANK & ALLEE 316 ; osmotic regulation in steno- and eury-haline teleosts, POLONOVSKI & LINDENBERG 793 ; osmotic regulation (popular account), ROSENTHAL 841 ; effect of saline solution on thyroid activity in *Cyprinus* and *Ameiurus*, OLIVE-REAU 753 ; changes in chloride cell of *Anguilla*, GETMAN 351 ; chloride cells in *Fundulus*, BURNS & COPELAND 138 ; effect of inorganic salts on tissue fluids and blood of *Lepomis*, ABEGG 6 ; experiments on euryhalinity of *Blennius*, RAFFY 813.

Influence of temperature.—Effect of lowered temperature on oxygen consumption, brain metabolism and opercular rhythm, FREEMAN 326 ; of low temperature on development of fish embryos, NIKIFOROV & TRUSOV 734 ; on heart beat of *Salmo* embryos, GRODZINSKI 370 ; on number of vertebrae, TÄNING 971.

PHYSIOLOGY

Senses.—Use of labyrinth in sound perception, DIJKGRAAF 255 ; interaction of eye and labyrinth in response to light rays, HOLST 447 & 448 ; experiments on hearing in fishes (popular account), INGER 468 ; lateral line a short range auditory system, PUMPHREY 307 ; properties of photoreceptors in *Lampetra*, STEVEN 939 ; perception of sounds by Cyprinids and its significance, DIJKGRAAF 253 ; perception of sounds by *Gobio*, DAVID 231.

Lateral line.—Review of recent work on functions of lateral line and ampullae of Lorenzini, DAGET 222.

Luminous organs.—Luminescence in indirect emission organs, HANEDA 398.

Nervous system.—Functional regulation in *Fundulus* embryos with abnormal brains, OPPENHEIMER 757 ; reaction to alternating electric currents, CHERNIGIN 195.

Digestive system.—Digestion of higher carbohydrates by *Ctenopharyngodon*, MIGITA & HASHIMOTO 666.

Metabolism.—Oxydative metabolism in *Scyllium*, DOHRN & REIN 257 ; relation between muscular action and oxygen consumption in *Cyprinus*, SECONDAT 892.

Respiration.—In *Rhina*, ISELSTÖGER 475 ; critical oxygen tension and its effect on vitality in *Salmo*, LINDROTH 602 ; influence of oxygen concentration on *Salmo* PRIVOLNEV 800 ; oxygen consumption and activity of *Schilbeodes* and *Ictalurus*, HIGGENBOTHAM 430 ; experiments on *Umbra*, GEYER & MANN 352 & 353 ; comparison of respiratory metabolism at differing temperatures in *Boreogadus* and *Idus*, PEISS & FIELD 772 ; in marine teleosts, HENSCHEL 417 ; effect of hormones on oxygen consumption, MANN 629.

Blood.—Assessing blood volume of fishes, MARTIN 633 ; oxygen in erythrocytes of Pisces, KORSHUYEV 554 ; oxygen exchange in Chondrostei, KORSHUYEV & BULATOVE 555 ; blood cells of diseased *Salmo*, KATZ 525 ; clotting in spent *Oncorhynchus*, KATZ & SOUTHWARD 527 ; temperature relations of salmonid eggs, HAYES 415 ; selected temperature in *Salmo* correlated with response to electrical stimulus, FISHER & ELSON 288 ; on embryonic development of *Misgurnus*, PERSOV 775 ; low temperature on propagation and development of *Abramis*, SIROVATSKAYA 916.

Locomotion and equilibration.—relation between oculo-motor muscles, fins and equilibrium, BARON 63 ; muscles concerned with equilibrium, BARON 62 ; function of fins, HARRIS 405 ; maintenance of equilibrium by means of the labyrinth, LOWENSTEIN 608 ; relation of scale size to movement, GRINBERG 369 ; effect of fin clipping on cruising speed of *Carassius* and *Oncorhynchus*, RADCLIFFE 811 ; swimming speed of *Catostomus*,

WALES 1024; locomotory system in Cichlids, BAERENDS & BAERENDS 48; effect of elimination of labyrinth on equilibrium in *Gobius*, DIJKGRAAF 255.

Air Bladder.—Method of reaction to decrease in pressure, DIJKGRAAF 254.

Colour.—Studies on colour pattern formation, GOODRICH, HINE & REYNOLDS 360; experiments on simultaneous colour changes, HERTER 425; effect of pituitary extract on chromatophores, WEISEL 1034; growth of pigment cells in *Salmo*, SCHNAKENBECK 880; pigmentation in embryos and larvae of Cyprinoid fishes, SMIRNOV 919; carotenoid pigmentation in *Hypsypops*, KRITZLER ET AL 563; pattern variability in *Bathygobius*, TAVOLGA 976.

Endocrinology.—Measurement of hypophysis activity, ALPATOV & STROGANOV 22; possible relationship between hypophysis and osmotic regulation, FONTAINE & RAFFY 300; effect of hypophysis on blood content after injection of adrenalin, LAUR 584; physiological role of neurohypophysis, HELLER 416; study of hormones, BUDDENBROCK 134; influence of pineal organ on light reaction and pigment control, BREDER & RASQUIN 122; effect of anti-thyroids on thyroid of *Scyliorhinus*, OLIVIEREAU 754; functions of basophile cells in hypophysis of *Acipenser*, BARANOVA 60; thyroid gland production in Acipenseridae, IRIKHIMOVITCH 471; effect of thiourea on blood metabolism in *Cyprinus*, HATEY 413; changes in *Salmo* parr due to feeding with thyroid extract, LAROCHE ET AL 580; relation of thyroid activity to seaward migration in *Oncorhynchus*, HOAR & BELL 433; neurosecretory cells and their relation to hypophysis in *Cyprinus*, POLENOV 789; effect of alloxan on pancreas of *Lebistes*, GROSSO 376; exophthalmus produced in *Dentex* by thiourea injections, LELOUP & OLIVIEREAU 591.

Electric organs.—Of *Electrophorus*, COATES & NACHMANSOHN 208.

Electrical properties.—Speed of conduction of stimuli in optic nerve of *Ameiurus*, BUSER & SCHERRER 143.

Reactions to narcotics.—Sensitivity to solutions of ammonia, phenol and prussic acid, WOKER & WUHRMANN 1063.

BIOCHEMISTRY

Catalysis of different tissues of teleosts, PRIVOLNEV 801; chemical constituents of shark bone, TAKAHASHI & KIKUCHI 964; chemical constituents of placoid scale, TAKAHASHI & YOKOYAMA 965; chemical properties of carotenoids, GOODWIN 361; general chemistry of Salmonid eggs, HAYES 415; haemoglobin content of blood in *Ophicephalus*, DHAR 245; data on blood analyses of *Ictalurus*, HIGGINBOTHAM & MEYER 431; carotenoid pigmentation in *Hypsypops*, KRITZLER ET AL 563; protein and mineral content of some Indian freshwater fishes, AIRAN 11; acetylcholine content of some marine fishes, JULLIEN & RIPLINGER 509; acetylcholine content of organs of some freshwater fishes, JULLIEN, LAURENT & RIPLINGER 508; phosphorus compounds of skeletal muscle, TARR 974; fat content of muscles of some marine fishes, PATAKOOT, PRADHAM & MURTI 770; the *B*-alanine in the muscles of Ganoidei and Teleostei, YONDAYEV 1078; effect of muscular activity on sugar content in blood of *Cyprinus*, SECONDAT 893; alkaline phosphatase of nidamental gland of selachians, TANZI & BATTAGLIA 973; presence and function of alkaline phosphatase in kidney, BROWNE, PITTS & PITTS 130; liver oil properties of Philippine Euselachii, HAMM 395; liver oil yield from some deep sea sharks, HIGASHI, MASUDA & ISEKI 429; vitamin A content of some S. American sharks, SICCARDI 913; potential vitamin A content of some teleosts, TEIXEIRA E SILVA 980; melanophorhormone content of pituitary of deep-sea fishes. MIGITA & ARAKAWA 665; iodine content of *Petromyzon*, FONTAINE & LELOUP 298; of *Salmo*, FONTAINE & LELOUP 297; of *Salmo* and *Alosa*, FONTAINE & LELOUP 296; of young *Salmo* in fresh water, FONTAINE & LELOUP 299; iodine concentration in thyroid of some Scaridae, SMITH & MATTHEWS 920; digestion of proteids in *Cyprinus*, JANČÁŘIK 480; glycogen content of *Salmo*, FONTAINE & HATEY 294; variations in glycogen content in young *Salmo*, FONTAINE & HATEY 295; variations in fat content of *Clupea*, JENSEN 487; origin and distribution of lipids in egg food-reserve of *Salmo* embryos, MATHUR 638; the granulocytic cyanotannophile syndrome, SALAZAR 854.

REPRODUCTION AND SEX

Age and size at sexual maturity.—*Polyodon*, LARIMORE 578; *Scoliodon*, SETNA & SARANGDHAR 904; *Caspialosa*, OSTROUMOV 763; *Hilsa*, CHACKO 178; *Sardina*, BARDAN & NAVARRO 61; FERNANDEZ & NAVARRO 283; MASSUTI ET AL. 636; *Salmo*, JONES 497; salmon-pair, ALM 17; ♀ salmon pair, FONTAINE & VIBERT 301; *Labeo gonius*, MOOKERJEE & GANGULY 685; *Gadus* from Baltic, CHRZAN 199; *Thyrstites*, BLACKBURN 103; *Trichiurus*, PRABHU 798; *Germo*, LOZANO 609; *Platichthys*, ORCUTT 759; *Gasterosteus* and *Pygosteus*, JONES & HYNES 498.

Differences between the sexes.—In *Xenodexia*, HUBBS 456; *Platichthys*, ORCUTT 759; sexual dimorphism in *Labeo boggut*, MISRA 675; in *Monacanthus*, CLARK 201; "pearl organs" present in both sexes, but more rarely in female, MATSUI 648.

Sex ratio.—In *Clupea*, FOREST 307; in *Salmo* in Åva stream, ALM 21; in *Perca*, WORTHINGTON 1067; in *Perca* and Centrarchidae of Michigan; BECKMAN 78; differences in ratio between populations of one species, apparent or real? ESCHMEYER 271.

Spawning season and place.—Of some Indian cyprinids, CHACKO & KURIYAN 187; successive spawning periods of pelagic fishes in the Black Sea, SMIRNOV 918; breeding season of *Chiloscyllium*, SETNA & SARANGDHAR 903; of *Scoliodon*, SETNA & SARANGDHAR 904; *Clupea*, FAURE 280; records of *Clupea* spawning in English Channel, CORBIN 212; Black Sea *Engraulis*, MALIATSKY 627; *Sardinella*, DIEUZEIDE 250; *Sardinops*, 2; *Labeo calbasu* and *L. fimbriatus*, ALIKUNHI ET AL. 12; of *Gadus* from Baltic, CHRZAN 199; *Gadus*, *Clupea* and *Sebastes* along coast of N. Norway, WIBORG 1056; *Esox*, CLARK 200; *Calamus*, *Pagrus* and *Rhomboplites* spawning off N. Carolina, WALKER 1026; *Pseudosciaena*, MATSUI & TAKAI 649; *Apogon*, GARNAUD 345; *Gymnammodytes*, CORBIN 213; *Trichiurus*, PRABHU 798; *Euthynnus*, *Katsuwonus* and *Neothunnus*, WADE 1020; *Scomber*, CORBIN 211; *Polynemus*, KARANDIKAR & PALEKAR 523 & 524; *Gobiopterus*, PILLAY & SAROJINI 784; *Ophicephalus*, MOOKERJEE, GANGULY & BHATTACHARYA 686; *Rhombus*, KÄNDLER 518.

Factors influencing spawning.—Types of stimuli causing release of spawning activity, FABRICIUS 275; effect of flood water on spawning in W. Virginia, SEAMAN 891; effect of off-season freshets on Cyprinids in Tungabhadra river, GANAPATI & ALIKUNHI 342; alteration of spawning period of *Coregonus* due to decrease in temperature, JOHANSON 493; light as a factor influencing early spawning in *Notropis*, HARRINGTON 404.

Breeding habits.—Of *Lampetra*, DYK 263; of *Cetorhinus*, MATTHEWS 650; spawning behaviour of *Salmo*, JONES & KING 499; of *Oncorhynchus*, CURTIS & FRASER 220; of *Esox*, CLARK 200; of *Apistogramma*, SENFET 901; of *Hyphessobrycon*, KLUGL 550; of *Leucaspis*, SARTORIUS 858; of *Leuciscus*, ABRAHMS and *Esox*, SVÄRDSON 952; of *Puntius partipentazona*, DRÜGE 261; of *Corydoras*, SELEUTHNER 900; of *Nothobranchius*, CADE 147; of *Pachypanchax*, BECKER 76; *Hippocampus*, good photographs, HESS 427; of *Apogon*, GARNAUD 345; of *Apogon imberbis*, GARNAUD 346; of Cichlids, BAERENDS & BAERENDS 48; of *Cichla*, FONTENELE 303; of *Hemichromis*, PETERS 776.

Fertilization.—physiological conditions affecting fertilization, ELSTER & MANN 269; processes occurring in *Lampetra* on fertilization, MONTALENTI & SCHARTAU 682.

Vivipary.—In the Pleurotremata, TORTONESE 988.

Reproductive cycle.—In *Cetorhinus* MATTHEWS 650; in *Engraulis*, ANDREU 37; ovulation in *Mustelus*, TEWINKEL 981; relation between liver and gonad weights during annual cycle, BOUGIS 118; light induced preseasonal spawning in *Notropis*, HARRINGTON 404; effect of light on reproductive cycle of *Gasterosteus*, ECKHOUDT 267; number of days survival of spawning in ponds of *Plecoglossus* according to sex, temperature and segregation or aggregation of sexes; MATSUI 643.

Hormones and sex.—Spawning induced in carp by hormone injection, KAWAJIRI ET AL. 535; ovulation in *Cobitis* induced by frog pituitary, injected and *in vitro*, KAWAMURA & MOTONAGA 530; use of pituitary hormone for ripening loach eggs, FUJITA ET AL. 332; hypophysis influence on oocytes nuclei in Acipenseridae, KAZAN-

SKI 536; induction of gonadal development in *Ctenopharyngodon* by hormones, KAWAMOTO 529; effect of sex hormones on reproductive system of ♀ *Heteropneustes*, KAR & GHOSH 522; reproductive activity related to formation of antitoxins, CALLAMAND 150; activity of carotenoids during spawning period of *Cyclopterus*, GOODWIN 361; effect of carotenoids in ova of *Salmo*, STEVEN 938; factors controlling somatic sexual phenotype in *Lebistes*, GALLIEN 338.

Hermaphroditism.—intersexuality in fishes, PONSE 794; In Teleosts, ANCONA 33; In *Scyliorhinus*, ARTHUR 41; Hermaphrodite *Hilsa*, CHACKO & KRISHNAMURTHI 184; in sexually mature *Salmo* pair, FONTAINE & VIBERT 302; in *Osmerus*, JENSEN 492; in *Sparus*, ANCONA 32; PASQUALI 769.

Parthenogenesis.—Parthenogenetic cleavage of egg-cell in *Acipenser*, DETLAF & GINZBURG 238; In *Coregonus*, MELANDER & MONTÈN 657.

Number of eggs produced.—Fecundity of *Clupea*, KATZ & ERICKSON 526; *Engraulis*, ANDREU 37; *Hilsa*, KULKARNI 568; *Salmo*, JUSZCZYK 512; *Salvelinus* from Swedish waters, MÄÄR 614; number of ripe ovarian eggs of *Hypomesus*, YANAMOTO 1074.

Hybridization.—(See also under section on Evolution, Variation and Genetics.)

Hybridization among species of *Acipenser*, NICOLUKIN & TIMOFEYEV 733; Experiments on hybridization in *Petromyzon*, COTRONEI 215; Cross-mating of two spp. of *Aequidens* with development of eggs to blastula, KLEIN & DEMBROW 549; natural hybridization of *Platichthys* with *Kareius* and *Parophrys*, ORCUTT 759.

Parental care.—In Cichlids, BAERENDS & BAERENDS 48; oral incubation of eggs by *Apogon*, GARNAUD 345 & 346.

EVOLUTION, VARIATION AND GENETICS

Variation.—The adipose fin of Teleostei as a new formation, VASNETZOV 1008.

Hybrids.—(See also under section on Reproduction and Sex); Artificial cross between *Rutilus rutilus* and *Leuciscus*

danilewski, NIKOLJUKIN 735; Characters of five *Salmo* hybrids, STOKELL 943.

Genetics.—Divergent characters in forms of *Salmo* due to genetic factors, ALM 19; Absence of adipose fin in *Salmo* as a mutation, SVÄRDSON 954; Factors controlling somatic sexual phenotype in *Lebistes*, GALLIEN 338; colour pattern and gene frequency in *Platycephalus*, GORDON & GORDON 364; Inheritance of colour markings in *Macropodus*, SCHWIER 889; Pigmented tumours in fish, GORDON 365.

Chromosome studies.—On Salmonidae SVÄRDSON 950; *Coregonus*, KUPKA 569.

Radiation and speciation.—Comparison of "racial" differences in meristic characters with experimental production of phenotypic differences, TANING 971; Speciation in ancient lakes, BROOKS 127; Racial studies on spring and autumn *Clupea*, ALTNÖDER 23; *Sardina*, FURNESTIN 336; *Coregonus* of Central Europe, STEINMANN 936; Study of sympatric populations of *Coregonus*, SVÄRDSON 951; sexual selection as isolating mechanism among sympatric species of *Lebistes*, HASKINS & HASKINS 411; Speciation in *Cyprinodon* and *Empetrichthys*, MILLER 668; Isolating factors in races of *Cobitis*, MINAMORI 672; Racial in *Arripis*, FAIRBRIDGE 278.

Albinism, Melanism, etc.—An albinistic *Italurus*, McLANE 621; Experiments on vitality of albino and normal *Macropodus*, SCHWIER 890.

Phylogeny.—Of tetrapods, KESTEVEN 540; trends in Dipnoi, WESTOLL 1041; Of Scorpaenoid fishes, MATSUBARA 639; Of *Tinca*, TRETIKOV 994.

Evolution.—Origin and evolution of fish, SEVERTZOV 905; Of Dipnoi, WESTOLL 1042; Of tail in teleosts, AFFLECK 9; Of Cichlidae of African lakes, TREWAVAS 995.

Biometric studies.—On some Clupeids, DESBROSSES 237; *Clupea*, FAURE 280; POULSEN 797; *Sardina*, CREAC'H 218; FURNESTIN 334; LETACONNOUX 595; *Engraulis* from Morocco, FURNESTIN & COUPE 337; *Cypsilurus*, *Engraulis*, *Sardina*, *Etrumeus*, MURAKAMI & SHINDO 703; *Coregonus* from Léman, DOTRENS 259; Vertebral formula for *Sardina*, FERNANDEZ & NAVARRO 283

For *Sardina* and *Engraulis*, NAVAZ & NAVARRO 722; *Osmerus*, JENSEN 492; *Alburnus*, STANGENBERG 932; biometric comparison between Atlantic and Pacific species of *Neothunnus*, SCHAEFER & WALFORD 867; *Scombridae* from Spanish Coast, NAVAZ 721; *Ammodytes*, KÄNDLER 517; Japanese *Scorpaenoids*, MATSUBARA 639.

ECOLOGY AND HABITS

General bionomics.—Of *Petromyzon* in North America, SHETTER 908; Of Gulf of Mexico *Pleurotremata*, BAUGHMAN & SPRINGER 70; Of *Cetorhinus*, MATTHEWS & PARKER 651; Of *Galeocerdo*, KAUFFMAN 528; Of *Negaprion*, SPRINGER 931; Of *Alosa*, MOHR 678; Of *Coregonus*, WAGLER 1021; ZANDT 1082; Of *Salmo* from Åva stream, ALM 21; Of *Salmo* stocked in a lake in British Columbia, LARKIN, ANDERSON, CLEMENS & MACKAY 579; Of *Thymallus*, GUSTAFSON 389; Of *Osmerus*, JENSEN 492; MOHR 677; PIROSHNIKOV 786; Of *Clupea*, POULSEN 797; Of *Engraulis*, BLACKBURN 104; Of *Sardina*, FURNESTIN 335; LETACONNOUX 593; *Sardinops*, 2; BLACKBURN 102; Of *Nannostomus* in aquaria, MEINKEN 656; Of *Barbus carnaticus*, ALIKUNHI & RAO 13; Of *Catla*, CHACKO & KURIYAN 188; Of *Labeo gonius*, MOOKERJEE & GANGULY 685; Of *Lepidocephalichthys*, CHACKO, 173; Of *Lepidocephalus*, CHACKO 179; Of *Clarias batrachus*, MOOKERJEE & MAZUMDAR 687; Of *Cynoscion nebulosus*, MOODY 683; Of *Gadus*, CHRZAN 199; DESBROSSES 236; KÄNDLER 519; Of *Gadus minvatus*, MENON 661; Of *Archoplites*, MURPHY 704; Of *Lavinia*, MURPHY 705; Of *Perca*, PARSONS 768; Of *Poecilichthys* and *Etheostoma*, LACHNER ET AL. 574; *Stizostedion vitreum*, ESCHMEYER 271; Of *Mullus*, ANANIADIS 30; BORISSENKO 116; Of *Thyrstites*, BLACKBURN 103; Of *Gobioplecterus*, PILLAY & SAROJINI 784; Of *Neoplatycephalus*, FAIRBRIDGE 277; Of *Platichthys*, ORCUTT 759; Of *Rhombus*, KÄNDLER 518; Study of "Zoapocrosis" as a means of determining bionomics of fishes, HUNTSMAN 465.

Age and growth.—Method for determining age composition, KETCHEN 541; Effect of temperature on size, GUNTER 387; Relation between growth and population density, BECKMAN 79; Intensity of competition reflected in stan-

dard deviation of length-frequency curve, LARKIN, ANDERSON, CLEMENS & MACKAY 579; Reasons for occurrence of stunted populations, ALM 18; Growth of fishes from two Iowa lakes, LEWIS 597; Rate of growth of *Acipenser* in fresh- and salt-water, IRIKHIMOVITCH 470; Growth of *Clupea* larvae, JENSEN 488; Factors affecting size of *Clupea* on Norwegian coast, BJERKAN 100; Age and size grouping of *Clupea* from French coast, FOREST 307; Age class groupings of *Clupea* from Belgian coast, GILIS 355; Size and weight of *Clupea* from Spanish coast, OLIVER 752; Size and weight of *Engraulis* from N. Spain, ANDREU 37; Growth rate of *Sardina*, ANDREU, RODRIGUEZ-RODA & LARAÑETA 38; Length/weight relationship in *Sardina*, FERNANDEZ & NAVARRO 283; ITO 477; Length/weight relationship in *Sardina* and *Engraulis*, NAVAZ & NAVARRO 722; Length frequencies and age groups of *Sardinella*, CHIDAMBARAM 196; Growth of young *Salmo*, FROST 330; Age at migration of *Salmo*, JONES 497; Age groups of *Salmo* of Drumcliffe river, O'DRISCOLL 745; Scale studies of young *Salmo* in relation to growth, JONES 496; Variation in growth rates of *Salvelinus*, FAUTIN 281; Growth of *Coregonus* in Finnish waters, JÄRVI 482; Of growth of *Coregonus muksun*, BARSUKOV 65; Rapid growth in *Catla*, CHACKO & GANAPATI 182; Relative growth of *Cyprinus*, HAMAI 394; Changes with growth occurring in *Dorosoma*, MILLER 670; Age/length relationship in *Anguilla*, FROST 331; Growth of *Gadus* in Danish waters, KNUDSEN 551; Age analyses of year-classes of *Gadus*, HANSEN 399; Growth of *Phycis*, HART 410; Of *Esox* and *Perca* in Finnish waters, SEGERSTRÅLE 894; Length-weight relationship in *Perca* and six Michigan Centrarchidae, BECKMAN 77 & 78; Growth rate of *Lepibema*, LEWIS 596; Of *Aplodinotus grunniens*, BUTLER & SMITH 145; Of *Pseudosciaena*, MATSUI & TAKAI 649; Age of groups *Trachurus*, MURAKAMI & SHINDO 703; Rate of growth of *Döderleinia*, KIBESAKI 543; Length/weight relationships in *Germo*, LOZANO 609; Of immature *Sebastes*, PERLMUTTER & CLARKE 773; Of *Gasterosteus*, *Pygosteus* and *Spinachia*, JONES & HYNES 498; Notes on growth of *Molochophrys*, WHITLEY 1053; Giant fishes of Congo, POLL 792.

Fish marking experiments.—Results of *Clupea* tagging experiments, FRIDRIKSSON & AASEN 329; On *Clupea* in European waters, FRIDRIKSSON 327; On *Anguilla* in Baltic, MÄÄR 613.

Scale reading etc.—Use of bones for determining age and growth-rate, MENON 660; Use of otoliths for determining age, JONES & HYNES 498; Use of scale readings in fishery management, BINKLEY 97; Technique for temporary dry mounts, TUBB & PROCTOR 998; cause of "winter check" on *Salmo* scales, VAN SOMEREN 1007; Use of vertebrae and quadrate in determining age of *Phycis*, HART 410; age and growth of *Sebastes* calculated from scales and otoliths, PERLMUTTER & CLARKE 773.

Population studies.—Interrelationship between food, growth-rate and production in freshwater fish populations, LE CREN 586; method of calculating yearly survival rate, KURITA 570; Review of symposium, KESTIVEN 538; Alterations of features in *Caspialosa caspia* of Caspian, Black and Azovsk Seas, SVETOVIDOV 960; On *Clupea*, ANCELLIN 31; On Norwegian and Icelandic *Clupea*, RASMUSSEN 815; On *Clupea* from Danish waters, POULSEN 796; On *Clupea* from Belgian coast, GILIS 355; On *Clupea sprattus*, FURNESTIN 333; Correlation between size and number of vertebrae in *Clupea*, DANNEVIG 226; On *Engraulis* from Dutch waters, HAVINGA 414; On *Sardina*, LETACONNOUX 594; Work on *Sardina* from Cornish coast, HODGSON & RICHARDSON 436; On *Sardina* from Morocco, FURNESTIN 335; On *Coregonus* of L. Bourget, DOTTRENS 258; On *Salmo* from Åva stream, ALM 21; Comparative fertility of *Salmo* populations, MÄÄR 615; Fertility of *Salvelinus* populations in Swedish waters, MÄÄR 614; On *Gadus*, KÄNDLER 519; *Gadus* from Baltic, CHRZAN 199; On *Gadus* from W. Greenland waters, RASMUSSEN 814; On *Perca* in different lakes, ALM 18; On *Percichthys trucha*, MACDONAGH 617; Pattern variability in *Bathygobius*, TAVOLGA 976.

Sampling Technique.—Reliability of gill-net sampling, MOYLE 698.

Fluctuations of stock.—Abundance of pelagic eggs in Baltic Sea used as a measure of fluctuation, KÄNDLER 520;

Of some economically important S.E. Australian pelagic fishes, BLACKBURN & TUBB 106; Seasonal fluctuation of *Sardina*, ITO 477; *Sardinops caerulea*, 2; Of *Clupea* in North Sea and Skagerak, ANDERSSON 35; Of *Clupea* and *Gadus* in northern waters, ROLLEFSEN 838; Of spring herring in Hokkaido, TAUTI 975; Fluctuations in annual catch of Hokkaido herring, KAWANA 531; Of *Salmo* of R. Shannon, WENT 1038; Factors causing disappearance of *Salmo* from Ontario waters; WOLF 1065; Cycle dominance in Fraser river *Oncorhynchus*, RICKER 827.

Ecological surveys.—Ecology of a moorland pond (excluding fish), MACAN 616; Analysis of fish-population of a small lake, CARBINE & APPLGATE 151; Of Latvian lakes, BÉZINS 93; Of Emir lake, Ankara, GELDIAI 348; Of Red Hills Lake, India, CHACKO & DINAMANI 181; Environment of *Sardinops caerulea*, 2.

Ecological studies.—Physical limnology of Lakelse Lake, B.C., BRETT 124; Physical limnology of Great Slave Lake, RAWSON 821; Of Jordan Meadows, Vancouver, HARDY 402; Of some N. Florida ponds, DICKINSON 246; Of Cauvery river, GANAPATI & ALIKUNHI 341; Of sewage irrigated ponds in India, BASU 67; Of islands of New Caledonia, CATALA 158; Importance of living space on maintenance of fish stocks, SCHIEMENZ 870; U. Jurassic of Cerin (Ain), SAINT-SEINE 851.

Relations with physical environment.—Investigations into reasons for winter-kill, PUKE 805; Effect of gradient on grouping of fish fauna in running water, HUET 462; Correlation between temperature and size, GUNTER 387; Effect of physical and ecological changes on game fish in Bark Lake, MURRAY 706; Effect of climatic conditions on herring migrations in Korsk-Sea, YUDKIN 1081; Existence rate of *Plecoglossus* related to temperature fluctuations, MATSUI 643; Effect of earth vibrations on *Notemigonus*, BISHOP 98; Colour variation of *Bathygobius* in relation to environmental stimuli, TAVOLGA 976; Effect of environment on vertebral number in *Pleuronectes*, DANNEVIG 224.

Special habitats.—Desert and cave fishes (popular account), ATZ 42.

Introduction and acclimatization.—Of exotic fishes into Malaya, GOPINATH 363; Effects of introducing exotic fishes into fresh waters, HUET 463; Introduction of some freshwater fishes into the Oued N'Fis dam, Marrakesh, PLATEAU 788; Dangers of introducing exotic species into fresh water, BONT 114; Lahontan Basin species introduced into Sacramento river drainage, KIMSEY 544; Some introduced fish of S. California, EVANS & DOUGLAS 273; Notes on introduction of *Salmo* into California, WALES 1025; History of introduction of *Salmo* in S. Africa, BENNION 87; Introduction of varieties of *Cyprinus carpio* from Europe to Japan and interbreeding with local forms; MATSUI 645; Of *Ctenopharyngodon* and *Hypophthalmichthys* into Japanese waters, NAKAMURA 718; Of *Silurus glanis* in England, GLEGG 357.

Aestivation.—By *Amia*, NEILL 725.

Food and feeding habits.—Of some Indian fishes, CHACKO & MATHEWS 189; Of some young Madras fishes, CHACKO 172; Of some freshwater fishes of Victoria, N.S.W., BUTCHER 144; Plankton as food for fishes, HAGMEIER & KÜNNE 390; Nutrition of fish in the Far-North, PROBATOV 802; Utilization of minute particles suspended in water; FRANK & ALLEN 316; Food relationships of some species of Cyprinidae, STARRETT 934; Fresh-water Crustacea as food of Gadids, KAMSHILOV & MIRONOVA 516; Food of Kamloops trout in relation to season and progressive changes in fauna of a lake; LARKIN, ANDERSON, CLEMENS & MACKAY 579; Food of *Scoliodon*, SETNA & SARANGDHAR 904; Of post-larval Clupeoids, BAL & BAPAT 55; Of *Hilsa*, CHACKO & KRISHNAMURTHI 186; Of *Lycengraulis*, MENEZES 659; Of *Sardina*, FLEURY 293; Of Coregonidae in the mouth of Russian rivers, PIROSHNIKOV 787; *Salmo gairdnerii* and *Cristivomer*, LEONARD & LEONARD 592; Of young *Salmo*, FROST 330; Food of *Thynnichthys*, CHACKO & GANAPATI 183; Of some Indian Cyprinids, CHACKO & KURIYAN 187; Of larval *Cyprinus*, HRABÉ 454; Of *Labeo*, CHACKO & SUBRAMANIAN 191; Of *Gadus*, WIBORG 1057; Of *Micropterus* McLANE 622; *Plagioscion*, OLIVEIRA E SILVA & MENEZES 751; Of *Trichiurus*, PRABHU 798; Of *Germo*, LOZANO 609; Of *Mugil*, PILLAY 783; Of *Drepanop-*

setta, KRÜGER 564; Of *Gasterosteus* and *Pygosteus*, HYNES 467; Of *Pygosteus*, KAJ 514; Feeding habits of *Nocomis*, LACHNER 573; Of young Sciaenids, BAL & BAPAT 56; *Tilapia mossambica* feeding on green algae and thus controlling *Anopheles*, HOFSTEDE & BOTKE 441; Stomach contents of *Callorhynchus*, BAHAMONDE 49; Of *Pinguipes* BAHAMONDE 50.

Breeding Habits.—See under section on Reproduction and Sex.

Leaping, flying etc.—Notes on flight of *Euleptorhamphus*, MYERS 708; Use of pectoral fins by *Pelecus*, RAUTHER 820.

Migrations and movements.—Of fish through Roznow dam fish-ladder, JUSZEZYK 511; Extension of pelagic fish broods in S. North Sea during 1926-37, AURICH 44; Movements of fishes in Coleroon river, CHACKO 174; Of *Clupea* shoals in Irish Sea, SMITH 925; Of *Sardinella*, CHIDAMBARAM 196; Of tagged *Sardinops*, JANSSEN 481; Of tagged *Alosa* in St. Lawrence river, VLADYKOV 1018; Of Salmonidae, HUNTSMAN 466; Of Salmonids in Baltic sea, LEHMANN 589; Of tagged Irish *Salmo*, WENT 1036; Of *Oncorhynchus* as affected by flow-conditions at Hell's Gate, JACKSON 478; Of *Oncorhynchus gorboscha* in West Sakhalin, DVININ 262; of *Gadus*, BUCKMANN & ULBRICHT-STIER 133; Of *Anguilla* in L. Ellesmere, N.Z., HOBBS 434; Of *Anguilla* in Baltic, MÄÄR 613; Of *Perca* in Windermere, WORTHINGTON 1067; Of *Arripis*, HARDY 401; Of *Scomber*, STEVEN 940; Large shoals of *Anoplopoma* appearing in Monterey Bay, COX 216; Popular account, RIESER 828.

Distribution and climatic conditions.—Records of warm water Atlantic fishes near northern limit of their range, STEVEN 941.

Social behaviour.—Of *Hemichromis*, PETERS 776; "Leader of the shoal" in *Rutilus*, SAWYER 862; Aggressive behaviour in *Monacanthus ciliatus*, CLARK 201; Territorial rights and factors influencing establishment of residence in shells, BREDER 121.

Behaviour in aquaria.—Resting habits of *Gymnorhamphichthys*, COATES 207; Of some W. Indian Plectognaths, CLARK 201.

Associations with other organisms.—Types of association found amongst fishes, RIVERO 832; Fishes as inquilines in sponges, GUDGER 383.

Symbiosis.—Of *Amphiprion* with anemones, WILLIAMS 1061.

Aggregations.—Under drifting objects, HARDENBERG 400; Dynamics of the fish shoal, NIKOLSKI 737.

Adaptation.—Adhesive apparatus in *Glyptothorax*, BHATIA 94.

Diseases and parasites.—Of fishes from two Iowa lakes, LEWIS 597; Of fishes in Michigan waters, ALLISON 16; Treatment of bacterial gill-disease, RUCKER, JOHNSON & ERLING 843; Pigmented tumours in fish, GORDON 365; Tumour disease in *Anguilla*, CHRISTIANSEN & JENSEN 198; Bacterial infection of caudal fin of *Mollienisia*, SCHÄPERCLAUS 869; Pöpopulation of *Perca* infested with *Clinostomum*, ELLIOTT & RUSSETT 268; *Ichthyophthiriasis*, BUSCH 139; *Oodinium*, JACOBS 479; Defence against parasites, WUNDER 1070; Lampreys parasitic on Quebec fishes, VLADYKOV 1016; Photo of *Manta* showing labial parasites, HASS 412; Effect of parasites on body condition of *Gadus*, MATSUI 644; Isopod parasite on *Leuciscus*, ACHMEROV 8; Parasites of *Mola*, DARTEVELLE 227; Trematode parasite, MONOD 681.

Enemies.—Predators on *Salmo* fry, HULT & JOHNELS 464; Checks on populations of *Perca* and Centrarchidae by predator fishes, MOYLE, KUEHN & BURROWS 700; Effect of predators on Cottoidei in Baikal Sea, TALIEV 968.

Mortality.—Caused by "red water" (*Noctiluca*), BHIMACHAR & GEORGE 95; Caused by blue-green algae in L. Providence, MOORE 694; Due to protozoan *Gonyaulax*, CONNELL & CROSS 209; Relation of dissolved oxygen to winter mortality in lakes, COOPER & WASHBURN 210; Effect of explosives, FITCH & YOUNG 291; Of *Catla*, GANAPATI ET AL. 344; Mass, RICHTER 826; Mass mortality in Concepcion bay, FALKE 279; Fish remains in ocean deposits, BRONGERSMA-SANDERS 126; In U. Jurassic lithographic stones, SAINT-SEINE 851.

Defence and offence.—Account of *Carcharodon* attacks on man, GUDGER 379.

Sounds emitted by fishes.—BELLOMY 83.

DISTRIBUTION

a. GENERAL

Suggested biogeographical regions, CHABANAUD 160; Biological chart of Atlantic oceans, HENTSCHEL 418.

b. MARINE

General.—Changes in fish fauna of Iceland during the last 25 years, FRIDRIKSSON 328; Occurrence of fish-eggs and larvae along N. Norway coast, WIBORG 1056; Occurrence of Erythrean fishes in Mediterranean, KOSSWIG 556; Notes on abyssal fishes, BERTIN 91.

Arctic.—West Greenland, JENSEN 490.

North temperate and subarctic.—Faroes and Iceland, TÄNING 970; Norway, HOLGERSEN 442 & 443; SCHAANNING 863; Sweden, NYBELIN 744; Danish waters, BLEGVAD 109; BONDESEN 113; JENSEN 439; Ireland PRAEGER 799; WENT 1039; WENT 1037; Wales, MATHESON 637; English Channel, STEVEN 941; Concarneau, FOREST & LEGENDRE 308; LEGENDRE 587; Mediterranean, ANDREU 36; CHABANAUD 165; DIEUZEIDE & ROLAND 252; DIEUZEIDE 248 & 249; TORTONESE 989; Eastern Mediterranean, STEINITZ 935; Gulf of Castiglione, DIEUZEIDE 247; Gulf of Genoa, GUIGLIA 384; North Africa, DIEUZEIDE 250; N.W. African coast, LOZANO CABO, 610; Madeira, MAUL & KOEFOED 652; Atlantic, NANI 720; Eastern Atlantic, NYBELIN 743; Western Atlantic, GINSBURG 356; Western N. Atlantic, BIGELOW & SCHROEDER 96; SPRINGER 930; Japan, MATSUBARA 639 & 641; MATSUBARA & OCHIAI 642; Tokyo Bay, ABE 5; Newfoundland, MYERS & BÖHLKE 713; Georgia Strait, BARRACLOUGH 64; Fidalgo Island, Washington, HALSTEAD 392; Grand Isle, Louisiana, BEHRE 80; Texas coast, BAUGHMAN 69; KRAMER 560; Gulf of Mexico (off Texas), BAUGHMAN 68; California, BOLIN 111; RIPLEY 829; ROEDEL & RIPLEY 837; N. California, PHILLIPS 782; Southern California, BÖHLKE 110; FITCH 289; ROEDEL 835; Baja California, ROEDEL 836; Gulf of California, HARRY 409; Bahamas, HERALD 420.

Tropical.—Jamaica, SMITH 924; West Indies, FOWLER 313; Gulf of Mexico, BAUGHMAN & SPRINGER 70; Gulf of Venezuela, SCHULTZ 882; Panama Bay, GUDGER 381; Ecuador, ORCES 758; British Guiana, PALMER 764; Atlantic, POSTEL 795; E. Atlantic, CHABANAUD 162, 164 & 167; S. Atlantic, CHABANAUD 168; POLL 790; Red Sea, CHABANAUD 169; Gulf of Aden, FRASER-BRUNNER 323; Sierra Leone, CHABANAUD 161; Senegal, W. Africa, CADENAT 148; Off Belgian Congo coast, DARTEVELLE 227; Madagascar, ANGOT 39; Mauritius, BAISSAC 54; Cocos-Keeling Isl., MARSHALL 631; India, Ceylon, Burma, MISRA 673; Bay of Bengal, MISRA 674; Christmas Island, Indian Ocean, PALMER 765; Oceania, FOWLER 309; Pacific, RASS 817; Philippines, HERRE 422; Celebes sea, FRASER-BRUNNER 322; Marshall Islands, SCHULTZ 886.

South temperate.—Uruguay, BUEN 137; Chilean waters, YANEZ 1076; S. Africa, DAVIES 232; SMITH 923; Australia, BLACKBURN 104; WHITLEY 1047 & 1054; W. Australia, WHITLEY 1046; N.W. Australia, WHITLEY 1055; East coast of Queensland, CHABANAUD 170; Great Barrier Reef, BARTON 66; New Caledonia, CATALA 158; New Zealand, HUBBS 457.

c. FRESHWATER

General.—Correlation between distribution and hydrographic history in desert basins of Western United States, HUBBS & MILLER 459; Effects of Himalayan glaciation, HORA, 449.

Palaeartic.—Finland, BRANDER 120; Ireland, PRAEGER 799; Essex, England, BROUGHTON 128; Denmark, JENSEN 489; France, JEAN 486; S. France, SCHACHTER 864; Italy, VATOVA 1009; Berlin, HERTER 424; Danube basin, OLIVA 747, 748 & 749; Slovakia, FERIANC 282; Czecho-Slovakia, KOMÁREK 552; Poland, KAJ 514; Iran, BERG 88; BRUNN & KAISER 131; SVETOVIDOV 962; Turkestan, LINDBERG 601; Siberia, MENSCHIKOW 662; Amur basin, NIKOLSKI 736; River Kuma, Russia, PROBATOV 803; China, LIANG 600; Yunnan, CHENG 193 & 194; Fukien, China, LIANG 599; Kiangsi, TCHANG 977; Tung Ting Lake (Yangtze basin), CHOW 197.

Nearctic.—British Columbia, CARL 153; North Central States, EDDY & HODSON 266; Great Lakes region, SHETTER 908; Province of Quebec, VLADYKOV 1017; Mississippi, BAILEY & TAYLOR 53; Maine, EVERHART 274; Iowa, HARRISON 408; Boone County, Iowa, STARRETT 933; Illinois river, MOORE & PADEN 692; Maryland CRAWFORD 217; N. Carolina, BAILEY 51; California, SHAPOVALOV & DILL 906; S. California, EVANS 272; Yosemite National Park, HUBBS & WALLIS 460; Nevada, TANNER 972; Oklahoma, BLAIR 107; MOORE & CROSS 691; New Mexico, MILLER 669; Texas, BAUGHMAN 68; Homosassa Springs, Florida, HERALD & STRICKLAND 421; Florida, KRITZLER 562; REID 824.

Central America.—Mexico, ALVAREZ 25 & 26; BUEN 136; MILLER 667; Guatemala, HUBBS 456; Honduras, CARR & GIOVANNOLI 155; Hispaniola, Haiti, RIVAS & MYERS 831; West Indies, FOWLER 313.

South America.—GÜNTERT 388; Peru, FERNANDEZ-YEPEZ 287; Colombia, FOWLER 311; Venezuela, FERNANDEZ-YEPEZ 284 & 286; MYERS 712; SCHULTZ 882; British Guiana, FRASER-BRUNNER 321; LADIGES 575; Dutch Guiana, HOEDEMAN 438; Brazil, AMARAL CAMPOS 27; FOWLER 310; MYERS, 712; TRAVASSOS 992 & 993; Upper Amazon, LADIGES 577; Uruguay, BUEN 137.

North Africa.—La Calle, Algeria, DIEUZEIDE & CHAMPAGNE 251.

Ethiopian.—Portuguese Guinea, FRADE, BACELAR & GONCALVES 315; Liberia, FOWLER 312; Lake Tanganyika, POLL 791; Tanganyika Territory, LOCKLEY 606; S. Africa, SMITH 921; Parfuri-Limpopo Rs., FITZSIMONS 292.

Oriental.—India, CHACKO 175; SILAS 915; India, Burma, Ceylon, MISRA 673; N.E. Burma, RENDAHL & VESTERGREN 825; Malaya, SOONG MIN KONG 926; TWEEDIE 1001; New Guinea, NICHOLS 729.

Australian region and Polynesia.—Northern Territory, Australia, WHITLEY 1047; W. Australia, SHIPWAY 911; Queensland, NICHOLS 728; Victoria, N.S.W., BUTCHER 144; Chatham Islands, STOKELL 942.

d. FOSSIL

General.—SAINT-SEINE 852; SCHINDEWOLF 872; Preparation, TOOMBS & RIXON 985; Text-book KUHN 567; Fossilization, WUNNENBERG 1073; Occurrence in deposits, BRONGERSMA-SANDERS 126; Mass mortality and fossil deposits, RICHTER 826; Significance of Old Red and marine Lower Palaeozoic vertebrate faunas, GROSS 374; L.O.R.S. faunas of Welsh Borders, WHITE 1043; Fishes of Congo, DARTEVELLE & CASIER 229; Fishes of Mexico, MALDONADO-KOERDEL 625, 626; Osteostraci, ROBERTSON 834.

Palaeozoic.—Of W. New York, CARTER 156; Silurian, ROBERTSON 834; SPIELDNAES 929; Devonian, CLARKE 203; DENISON 235; GORIZDRO-KULCZYCKA 366; GROSS 374, 375; JARVIK 483, 484, 485; PARRINGTON 766; STENSIÖ 937; WHITE 1043, 1044; Carboniferous, BISTROV 99; SCHMIDT 874; Permian, DOUGLAS 260; WILSON 1062.

Mesozoic.—Triassic, DECHASEAUX 234; RUSCONI 847; SCHAEFFER & DUNKLE 868; WHITE 1045; Jurassic, RUSCONI 844; SAINT-SEINE 850, 851; WUNNENBERG 1073; Cretaceous, AVINEMELECK 45; BAUZÁ RULLÁN 72; BROWN 129; DARTEVELLE & CASIER 228, 229; DECHASEAUX 234; GREGORY 368; OLIVEIRA & SANTOS 750; SANTOS 855; SIGNEUX 914.

Tertiary.—Eocene, BAUZÁ RULLÁN 73; CASIER 157; DARTEVELLE & CASIER 228, 229; Oligocene, BAUZÁ RULLÁN 71, 74; JONET 505, 506, 507; MIOCENE, BAUZÁ RULLÁN 72; DARTEVELLE & CASIER 229; WEINFURTER 1031, 1032; Pliocene, BAUZÁ RULLÁN 72, 75; MELÉNDEZ 658; RUSCONI 845, 846.

Quarternary.—HORA 449; LAURSEN 585.

III.—SYSTEMATIC INDEX

GENERAL

Vernacular names.—Of some Finnish freshwater fishes, ANON 40; Of freshwater fishes of Portuguese Guinea, FRADE, BACELAR & GONCALVES 315; Of Californian sharks and rays, ROEDEL & RIPLEY 837.

Classification.—Species criteria in *Osteostraci*, ROBERTSON 834; Origin of Tetrapods, KESTEVEN 540.

Faunistic works.—Keys to freshwater fishes of North Central States, EDDY & HODSON 266; Sharks and rays of California, ROEDEL & RIPLEY 837; Keys to Mexican fishes, ALVAREZ 26; Freshwater fishes of Brazil, FOWLER 310; Marine and freshwater fishes of Venezuela, SCHULTZ 882; Check list of fishes of India, Burma and Ceylon Pt II, MISRA 673.

MARSIPOBRANCHII

†HETEROSTRACI

Pteraspis crouchi figd. WHITE 1044.
Simopteraspis subgen. nov. type *Pteraspis leathensis* White descr. & figd., *P. gosseleti*, *P. vogti*, *P. primaeva* referred to subgenus and restored, WHITE 1044.

Traquairaspis symondsi figd., CLARKE 203.

†OSTEOSTRACI

Species criteria in, ROBERTSON 834.
Tremataspis, ROBERTSON 834.

CYCLOSTOMATA

Suggested derivation from Gnathostomes, BEMMELEN 86.

PETROMYZONIDAE

List of Quebec species, VLADYKOV 1016; Study of Eastern American larvae with two dorsal fins, VLADYKOV 1017.

Geotria australis notes and distribution, NANI 719.

Lampetra fluviatilis respiratory movements, ROBERTS 833; Endothelium of blood-vessels, SHEVCHENKO 910; *L. planeri*, fate of neural crest, NEWTH 727; Experiments on regeneration of skin, ORLOVA 761; Regeneration of muscles, ORLOVA 762; Notes on breeding, DYK 263 see also *Petromyzon*.

Petromyzon changes occurring in dermal connective tissue of head during metamorphosis, JOHNELS 494; *P. fluviatilis*, *P. marinus* experiments on hybridization, COTRONEI 215; *P. planeri* early development of head, VEIT 1010.

† PLACODERMI

ACANTHODII

Ischnacanthus sp. figd., CLARKE 20.

ARTHRODIRA

Jagorina, labyrinth cavity and eye
STENSIÖ 937.

Parapetalichthys nom. nov. for *Macropetalichthys* Broili, KUHN p. 202 (= *Pseudopetalichthys* Moy-Thomas) 567.

Phlyctaenaspis sherwoodi sp. nov. U. Devonian New York, DENISON 235 p. 565 5 text-figs. 3 pls.

SELACHII

†ICHTHYODORULITES

Listracanthus woltersi sp. n. U. Carbon. Westphalia, p. 44 text-fig. 1; all other spp. figd., SCHMIDT 874.

EUSELACHII

Key to Californian species, ROEDEL & RIPLEY 837.

PLEUROTREMATA

Of Gulf of Mexico, BAUGHMAN & SPRINGER 70; Reproduction, TORTONESE 988.

HEXANCHIDAE

Notidanus cf. *microdon* figd. from Cretaceous Majorca, BAUZÁ-RULLÁN 72.

ODONTASPIDAE

Odontaspis †*acutissima* figd. Pliocene Majorca, BAUZÁ-RULLÁN 72; *O.* †*cuspidata*, *O. acutissima*, *O. abbatei* Pliocene Argentine figd., RUSCONI 846; *O. (Synodontaspis)* †*hopei* figd. Eocene Spain, BAUZÁ RULLÁN 73; *O.* †*trutoti* figd. CASIER 157.

LAMNIDAE

Alopias †*latidens* Pliocene Argentine figd., RUSCONI 846.

Carcharodon †*auriculatus* figd. Eocene Spain, BAUZÁ RULLÁN 73; figd. CASIER 157; *C.* †*megalodon* figd. Miocene Majorca BAUZÁ RULLÁN 72; *C. mexicanus* figd., MALDONADO-KOERDELL 624.

Cetorhinus maximus anatomy and physiology of reproduction, MATTHEWS 650; anatomy and bionomics, MATTHEWS & PARKER 651; Occurrence in Chilean waters, YANEZ 1076.

Lamna, muscle histology, KRÜGER 565; *L. obliqua* mut. *subserrata* figd., CASIER 157; *L. serrata* figd., OLIVEIRA & SANTOS 750.

Oxyrhina †*desori praecursor* figd. Eocene Spain, BAUZÁ RULLÁN 73; *O. thastalis* figd. Pliocene Majorca, BAUZÁ RULLÁN 72; *O. thastalis*, *O. desori* Pliocene Argentine figd., RUSCONI 846.

†*Squalicorax pristodontus* figd., OLIVERIA & SANTOS 750.

ORECTOLOBIDAE

Ginglymostoma †*thielensi* figd., CASIER 157.

RHINEODONTIDAE

Rhineodon typus from Panama Bay, GUDGER 381.

SCYLIORHINIDAE

Haploblepharus key to S. African species, SMITH 923; *H. fuscus* sp. nov. East London and Knysna, S. Africa, SMITH 923 p. 883 fig.

Proscyllium alcocki sp. nov. Andaman Sea, MISRA 674 p. 87 fig.

Scyliorhinus caniculus abnormalities in sexual apparatus, ARTHUR 41; *S. gilberti* figd., CASIER 157; *S. guttatum* figd. from Pliocene Majorca BAUZÁ-RULLÁN 72; *S. torazame* recorded from Philippines, HERRE 422.

CARCHARINIDAE

Key to genera without spiracles, SPRINGER 930.

Key to genera and species of Texas, BAUGHMAN & SPRINGER 70.

Carcharias (Aprionodon) †*acanthodon* figd. from Pliocene Majorca BAUZÁ RULLÁN 72; *C. tegertoni* Pliocene Argentine figd., RUSCONI 846.

Carcharhinus notes on Mediterranean species, TORTONESE 989; *C. velox* from Baja California, ROEDEL 836.

Eugaleus †*affinis* figd., from Pliocene Majorca, BAUZÁ RULLÁN 72; *E. trecticonus* figd., CASIER 157.

Eulamia key to Western North Atlantic species, SPRINGER 930; *E. altima* sp. nov. Florida Keys, SPRINGER 930 p. 9; *E. lamia* recorded from Parfuri-Limpopo junction (photo), FITZ-SIMONS 292.

Eusphyra blochii, TORTONESE 987.

Galeocерdo arcticus bionomics, KAUFFMAN 528; *G. latidens* figd., CASIER 157.

Galeolamna pleurotaenia tilstoni subsp. nov. Van Cloon Shoal, W. Australia, WHITLEY 1055 p. 100 fig.

Mustelus canis ovulation and early development, TEWINKEL 981.

Negaprion brevirostris bionomics, SPRINGER 931.

Prionodon tegertoni figd. from Pliocene Majorca, BAUZÁ RULLÁN 72.

Pterolamia gen. nov. type *Squalus longimanus* Poey, SPRINGER 930 p. 7.

Scoliodon longurio, biometry and distribution, HUBBS & MCHUGH 458; from Baja California, ROEDEL 836; *S. sorra-kowah* development and bionomics, SETNA & SARANGDHAR 904.

Scylliogaleus queketti from Richards Bay, S. Africa, SMITH 923.

Sphyrna review of genus, TORTONESE 987; Key to species, FRASER-BRUNNER 324; *S. bigelowi* Springer = *S. tudes* Val., TORTONESE 990; *S. ligo* sp. nov. Clarence river, N.S. Wales, FRASER-BRUNNER 324 p. 214 fig.; *S. †prisca* Pliocene Argentine figd., RUSCONI 846; figd. from Pliocene Majorca BAUZÁ RULLÁN 72; *S. tudes* auctorum = *S. mokarran* Rüppell, TORTONESE 990.

†EDESTIDAE

Helicoprion cf. *davisii* rec. M. Permian Persia, DOUGLAS 260; *H. mexicanus* figd., MALDONADO-KOERDELL 624.

HETERODONTIDAE

Molochophrys galeatus notes on growth, WHITLEY 1053.

PRISTIPHORIDAE

Pristiophorus japonicus structure of labyrinth, ISELSTÖGER 473.

SQUALIDAE

Atractophorus armatus, SMITH 923.

Centrophorus †adonis sp. nov. U. Cretaceous Lebanon, SIGNEUX 914 p. 316 text-fig. B.

†*Centrosqualus* gen. nov. type *Spinax †primaevus* Pictet, SIGNEUX 914 p. 316 text-fig. C.

Squalus †latidens figd., SIGNEUX 914.

SQUATINIDAE

Squatina †subserata figd. from Pliocene Majorca, BAUZÁ RULLÁN 72.

HYPOTREMATA

TORPEDINIDAE

Diplobatis pictus sp. nov. British Guiana, PALMER 764 p. 480 fig.

RHINOBATIDAE

Rhinobatus columnae labyrinth organ, ISELSTÖGER 474.

PRISTIDAE

Pristis key to Venezuelan species, SCHULTZ 882; *P. †aff. brevis* figd., CASIER 157; *P. zysron* from east coast of Africa, SMITH 923.

RAJIDAE

Descriptions of eggs of Japanese species, ISHIYAMA 476.

Breviraja atripinna off Cuba p. 390 fig., *B. cubensis* off Cuba p. 394 fig., *B. sinus-mexicanus* Gulf of Mexico p. 396 fig., *B. spinosa* off Florida p. 400 fig., *B. yucatanensis* off Yucatan p. 402 fig., spp. nov. BIGELOW & SCHROEDER 96.

Raja brachyura from Mediterranean, DIEUZEIDE & ROLAND 252; *R. jensen* off S. New England p. 385 fig., *R. mollis* S. Nova Scotia p. 388 fig., spp. nov., BIGELOW & SCHROEDER 96.

DASYATIDAE

Key to Venezuelan genera and species, SCHULTZ 882.

Dasyatis †cavernosus figd. Pliocene Majorca, BAUZÁ RULLÁN 72.

Trygon pastinaca from Irish Coast, WENT 1039.

Urotrygon venezuelae sp. nov. Gulf of Venezuela, SCHULTZ 882 p. 24 fig.

MYLIOBATIDAE

Aetobatis †sulcatus figd., CASIER 157.

Myliobatis ? aquila Pliocene Argentine figd., RUSCONI 846.

MOBULIDAE

Manta birostris underwater photographs, including association with *Naucrates* and *Remora*, HASS 412.

HOLOCEPHALI

CHIMAERIDAE

Genera redefined, BIGELOW & SCHROEDER 96.

Callorhynchus callorhynchus, stomach contents, BAHAMONDE 49.

Chimaera phantasma description of skeleton, TCHANG 979.

Hydrolagus colliei autonomic nervous system, NICOL 731 & 732.

Neoharriotta gen. nov. type *Harriotta pinnata* Schnakenbeck, BIGELOW & SCHROEDER 96.

OSTEICHTHYES

PALAEOPTERYGII

†ARCHISTIA

PALAEONISCIDAE

? *Challala cacheutenses* figd., RUSCONI 847.

Moythomasia nom. nov. for *Aldingeria* Gross Dec. 1942 non *Aldingeria* Moy-Thomas Oct. 1942, GROSS 375.

PLATYSOMIDAE

Platysomus sp. from Texas Permian, WILSON 1062.

? *Platysomus cajonensis* sp. nov. Jurassic Argentina, RUSCONI 844 p. 7 text-fig. 5.

PERLEIDIDAE

Perleidid rec. Bunter Worcestershire, WHITE 1045.

CLADISTIA

CHONDROSTEI

ACIPENSERIDAE

Acipenser güldenstädti hybridizing with *A. ruthenus*, NICOLUKIN & TIMOFEYEVA 733; *A. g. persicus* Kura river populations, GERBILSKI 349; *A. stellatus* parthenogenic cleavage of egg-cell, DETLAF & GINZBURG 238.

NEOPTERYGII

HOLOSTEI

Origins and relationships, SCHAEFFER & DUNKLE 868.

INCERTAE SEDIS

†“*Peltopterus*” *maeseni* descr. and fig., SAINT-SEINE 850.

PROTOSPONDYLI

†SEMIONOTIDAE

Lepidotes congolensis descr. and figd., SAINT-SEINE 850.

Semionotus kanabensis sp. nov. U. Triassic Utah, SCHAEFFER & DUNKLE 868 p. 3 6 text-figs.; *S. vallejenensis* sp. nov. Triassic Argentine, RUSCONI 847 p. 173 text-figs. 5.

†MACROSEMIIDAE

Ophiopsis lepersonni sp. nov. Jurassic Belgian Congo, SAINT-SEINE 850 p. 14 text-figs. 3, 4 pl. 1 fig. F.

AMIIDAE

Amia calva aestivation, NEILL 725.

†PYCNODONTIDAE

Acrotemnus yangaensis sp. nov. Cretaceous Congo, DARTEVELLE & CASIER 229 p. 211 pl. xx fig. 23

Coelodus crassus sp. nov. Maestrichtian Congo p. 208 pl. xvii fig. 6; *C. zambiensis* sp. nov. ? Maestrichtian Congo p. 209 pl. xvii fig. 2, DARTEVELLE & CASIER 229.

Hadrodus marshi sp. nov. U. Cretaceous Kansas, GREGORY 368 p. 1 text-figs. 1-2.

Pycnodus cf. *toliaipicus* figd., CASIER 157; *P. praecursor* sp. nov. Eocene Congo, DARTEVELLE & CASIER 229 p. 212 pl. xvii figs. 1, 3 (? 4-5, 7).

ISOSPONDYLI

Check list of species from India, Burma and Ceylon, MISRA 673.

ELOPIDAE

Key to Venezuelan genera and species, SCHULTZ 882.

ALBULIDAE

Key to Venezuelan genera and species, SCHULTZ 882.

Albula vulpes from Cocos-Keeling Islands, MARSHALL 631; metamorphosis, FITCH 290.

ALEPOCEPHALIDAE

Conocara wernerii redescribed and figd., with key to species, NYBELIN 743.

Noriona nom. nov. for *Normania* Parr 1937 non Brady 1866, STRAND 946 p. 401.

Xenodermichthys copei, NYBELIN 743.

EUPHARYNGIDAE

Rouleina watasei, MATSUBARA 640.

CLUPEIDAE

Distribution and abundance of economic Indonesian species, HARDENBERG 400; Structure of air-bladder, SVETOVIDOV 961.

Key to genera, LOZANO-REY 611.

Key to Venezuelan genera and species, SCHULTZ 882.

Alosa bionomics and development, MOHR 678; Systematic notes on Spanish species, LOZANO-REY 611; *A. sapidissima* movements of tagged specimens, VLADYKOV 1018.

Anchoa argenteus sp. nov. L. Maracaibo, Venezuela, SCHULTZ 882 p. 45 fig.

Anchovia nigra sp. nov. L. Maracaibo Venezuela, SCHULTZ 882 p. 39 fig.

†*Cladocyclus* Ag. incl. *Anaetodopogon* Cope, *Chiromystus* Cope & *Ennelichthys* Jordan; *C. ferus* sp. nov. U. Cretaceous Brazil, p. 130 pl. ii fig. 2 pl. iii figs. 1-2; *C. gardneri* descr. and figd., SANTOS 855.

Clupanodon punctatus identification of eggs, NAKAI 715.

Clupea Marking in European waters, FRIDRIKSSON 327; *C. pallasii* fecundity, KATZ & ERICKSON 526; *C. pilchardus* retinal structures, VILTER 1013; *C. sprattus*, LOZANO-REY 611.

Clupeonella delicatula systematic position, VLADIMIROV 1015.

Dorosoma review of genus with key to species, MILLER 670.

Engraulis australis bionomics, and population studies, BLACKBURN 104; *E. a. fraseri* subsp. nov. W. Australia, BLACKBURN 104 p. 67; *E. encrasicolus* systematic notes, LOZANO-REY 611; Morphological characteristics of Moroccan specimens, FURNESTIN & COUPE 337; Size, weight and reproductive cycle, ANDREU 37.

Ethmalosa fimbriata systematic notes, LOZANO-REY 611.

Harengula key to American species, RIVAS 830; *H. pensacolatae caribbaea* p. 294 fig., Fox Bay, Colon, Panama, *H. p. cubana* p. 298 fig. Prov. of Pinar del Rio, Cuba, *H. p. floridana* p. 301 fig. Old Rhodes Key, Fla., *H. p. pinensis* p. 302 fig., Isle of Pines, Cuba, subspp. nov. RIVAS 830.

Hildebrandichthys setiger gen. et sp. nov. Caño de Sagua, Venezuela, SCHULTZ 882 p. 49 fig.

Hilsa ilisha notes on early development, JONES & MENON 504; *H. kanagurta*, *H. toli* notes on food, CHACKO & KRISHNAMURTHI 185 & 186.

Ilisha apapae Hildebrand a synonym of *Ilisha amazonica*, MYERS 707; *I. deauratus* Nakashima a synonym of *Ilisha altamazonica*, MYERS 707; *I. iquitensis* Nakashima a synonym of *Ilisha amazonica*, MYERS 707.

Lycengraulis barbouri, food, MENEZES 659; *L. limnichthys* sp. nov. Rio Agua Caliente, Venezuela, SCHULTZ 882 p. 51 fig.

Opisthonema libertate from S. California, FITCH 289.

Pseudochirocentrodon amazonicum Miranda Ribeiro a synonym of *Ilisha amazonica*, MYERS 707.

Sardina melanosticta identification of eggs, NAKAI 715; *S. pilchardus* systematic notes, LOZANO-REY 611.

Sardinella systematic notes on and key to Spanish species, LOZANO-REY 611.

Sardinops caerulea, bionomics, 2; *S. neopilchardus* bionomics, BLACKBURN 102.

Setipinna phasa notes on eggs and young, JONES & MENON 503.

Spratelloides delicatulus from Cocos-Keeling Islands, MARSHALL 631.

Thrissocles baelama from Cocos-Keeling Islands, MARSHALL 631.

CHANIDAE

Chanos chanos from Cocos-Keeling Islands, MARSHALL 631.

SALMONIDAE

Scales of Manchurian species figured, MATSUI 647; Chromosome studies, SVÄRDSON 950.

Coregonus population and biometric studies, DOTTRENS 259; a new system for Central European species, STEINMANN 936; Relict forms in W. Pomerania, KAJ 515; Environmental differences in morphological characters of two species, SVÄRDSON 958; bionomics, WAGLER 1021; Food of in Russian rivers, PIROSHNIKOV 787; *C. albula*, SEGERSTRÅLE 896; age and growth in Finnish waters, JÄRVI 482; *C. lavaretus*, SEGERSTRÅLE 897; Of L. Bourget, DOTTRENS 258; *C. lavaretus* and *C. albula* considered as sibling species, SVÄRDSON 951; *C. wartmanni* population study, ZANDT 1082.

Cristivomer namaycush, food in a Michigan lake, LEONARD & LEONARD 592.

Oncorhynchus reasons for variation in survival rate, BRETT & MCCONNELL 125; *O. gorbusha* morphometry and migrations, DVININ 262; *O. kisutch* blood clotting time in spent fish, KATZ & SOUTHWARD 527; *O. nerka* effect of ultraviolet radiation on eggs and alevins, BELL & HOAR 81; *O. n. kennebecensis* spawning habits, CURTIS & FRASER 220.

Salmo gairdnerii food, LEONARD & LEONARD 592; *S. g. kamloops*, bionomics in a lake in Br. Columbia, LARKIN, ANDERSON, CLEMENS & MACKAY 579; *S. gilae* sp. nov. Gila river, New Mexico, MILLER 669 p. 11 fig.; *S. gilae*, *S. clarkii* *S. gairdnerii* notes on, MILLER 669; *S. mamoratus*, *S. macrostigma* variations in number, and method of counting, fin-rays, NÜMANN & SELLA 741; *S. salar* in Ontario, WOLF 1065; spawning behaviour, JONES & KING 499; use of parr for fertilization of eggs, ALM 17; a sexually mature hermaphrodite parr, FONTAINE & VIBERT 302; Progeny of male parr, JONES & KING 500; With no adipose fin, SVÄRDSON 954; *S. s.*, *S. trutta* food and growth of young, FROST 330; *S. trutta* biological investigations, PYE-FINCH 809; Influence of temperature on number of vertebrae, TÄNING 971.

Salvelinus oquassa occurrence in Maine, EVERHART 274.

Thymallus thymallus bionomics, GUSTAFSON 389; *T. vulgaris*, SEGERSTRÅLE 398.

OSMERIDAE

Hypomesus olidus, sarcoma, HOSHINA 453; Number of ripe ovarian eggs, YANAMOTO 1074.

Osmerus eperlanus bionomics, JENSEN 492; Bionomics and development, MOHR 677; *O. e. dentex* bionomics, PIROSHENKOV 786.

Plecoglossus altivelis, survival in ponds, MATSUI 643; Sexual differences and differences due to environment, MATSUI 648.

RETROPINNATIDAE

Retropinna chathamensis sp. nov. Henga, Chatham Islands, STOKELL 942 p. 206 fig.

GALAXIIDAE

Paragalaxias revision of genus, STOKELL 944.

GONOSTOMATIDAE

Gonostoma vitiazi sp. nov. 360 miles south-east of Urup Island, Pacific, RASS 817 p. 1041.

STERNOPTYCHIDAE

Argyropelecus olfersii new record for S.W. Norway, HOLGERSEN 443.

Polyipnus spinosus, *P. asteroides* from Japan, described and figured, MATSUBARA 641.

†ENCHODONTIDAE

Cimolichthys manzadinensis sp. nov. Cretaceous Congo p. 222 pl. xvii figs. 13, 14; *C. marginatus* noted, DARTEVELLE & CASIER 229.

Enchodus crenulatus sp. nov. Cretaceous Congo p. 219 pl. xxii fig. 9; *E. elegans* sp. nov. Cretaceous Congo p. 220 text-fig. 65 pl. xxii figs. 11-14; *E. cf. lemonnieri*, *E. faujasi* figd., DARTEVELLE & CASIER 229; *E. oliveirai* figd., OLIVEIRA & SANTOS 750.

CHAULIODONTIDAE

Chauliodus macouni inshore record from Georgia Strait, B.C., BARRACLOUGH 64.

HAPLOMI

ESOCIDAE

Exos lucius spawning habits in N.W. Ohio, CLARK 200; spawning habits, SVÄRDSON 952.

UMBRIDAE

Umbra krameri synonymy, HOLLY 444.

INIOMI

Check list of species from India, Burma and Ceylon, MISRA 673.

SYNODONTIDAE

Harpodon nehereus a non-luminous fish, HANEDA 397.

Synodus gracilis from Cocos-Keeling Islands, MARSHALL 631.

OSTARIOPHYSI

CYPRINOIDEA

CHARACIDAE

Structure and classification of African genera, including Citharinidae, MONOD 681.

Key to genera and species of Cynodontinae, SCHULTZ 887.

Key to genera and species of Hepsetinae, SCHULTZ 387.

Alestes, two subgenera recognized, *A. senegalensis* Stdr. = *A. nurse albolineatus* Holly = *A. nigrilineatus* Svensson = *A. leuciscus* Günther, structure and relationships, parasite, MONOD 681.

Autanichthys gen. nov. p. 11 type *A. giacopinii* sp. nov. Rio Autana, Venezuela, p. 12 fig., FERNANDEZ-YEPEZ 286.

Boulengerella, MYERS 709.

Brycon notes on species from São Paulo museum, AMARAL CAMPOS 27; *B. travassosi* sp. nov. Bodoquena river, Matto Grosso, AMARAL CAMPOS 27 p. 141 fig.

Charax key to species, SCHULTZ 387.

Cynopotamus key to species, SCHULTZ 387.

Cyrtocharax key to species, SCHULTZ 387; *C. kincaidi* sp. nov. Paraguay, SCHULTZ 387 p. 60.

Gilbertolus key to subspecies, SCHULTZ 387.

Gymnotichthys gen. nov. p. 9 type *G. hildae* sp. nov. Rio Autana, Venezuela, p. 10 fig., FERNANDEZ-YEPEZ 286.

Hydrocyon = *Hydrocynus*, present allocation to genera of Cuvier's original six species, MYERS 709.

Hypheosobrycon albolineatum p. 17 fig., *H. hildae* p. 18 fig. spp. nov. Rio Autana, Venezuela, FERNANDEZ-YEPEZ 286.

Microbrycon cochui sp. nov., Upper Amazon, LADIGES 577 p. 306 figs.

Moenkhausia schultzi sp. nov. Rio Autana, Venezuela, FERNANDEZ-YEPEZ 286 p. 13 fig.

Poecilurichthys myersi sp. nov. Rio Autana, Venezuela, FERNANDEZ-YEPEZ 286 p. 15 fig.

Pseuderythrurus gen. nov. p. 80, type *P. rosapinnis* sp. nov. Paramaribo, Dutch Guiana, p. 82 fig., HOEDEMAN 438.

Salminus brasiliensis, synonymy and type, MYERS 709.

GASTROPELECIDAE

Revision with key to genera and species, FRASER-BRUNNER 321.

Carnegiella notes on species, MYERS 711; Revision and key to species, FERNANDEZ-YEPEZ 287; *C. myersi* sp. nov. Yurimaguas, Peru, FERNANDEZ-YEPEZ 287 p. 175 figs.; *C. schererii* sp. nov. Pebas, Peru, FERNANDEZ-YEPEZ 287 p. 178 figs.; Possibly conspecific with *C. marthae*, MYERS 711; *C. strigata vesca* subsp. nov. Mazaruni river, British Guiana, FRASER-BRUNNER 321 p. 966 fig.

ANOSTOMIDAE

Key to genera, FERNANDEZ-YEPEZ 285.

Anostominae key to genera, MYERS 712.

Anostomus key to species, MYERS 712; *A. ternetzi* sp. nov. Palital, Venezuela, FERNANDEZ-YEPEZ 284 p. 293 figs.

Laemolyta fernandezi sp. nov. Upper Orinoco, Venezuela, MYERS 712 p. 197.

Leporinus brunneus sp. nov. Rio Negro, Brazil, MYERS 712 p. 195.

Synaptolaemus cingulatus gen. et sp. nov. Rio Orinoco, Venezuela p. 190, MYERS 712.

HEMIODONTIDAE

Nannobrycon gen. nov. type *Nannostomus eques* Stdr., HOEDEMAN 437 pp. 15 and 22; *Nannostomus* and *Poecilobrycon*, revision, HOEDEMAN t.c.

Nannostomus, behaviour in aquarium, MEINKEN 656.

CITHARINIDAE

Relegated to subfamilial rank, MONOD 681.

RHAMPHICHTHYIDAE

Hypopomus key to species, SCHULTZ 382 p. 65.

STERNARCHIDAE

Apteronotus key to Venezuelan species, SCHULTZ 382 p. 68; *A. cuchillo* sp. nov. Rio Socuy, Venezuela, SCHULTZ 382 p. 69 fig.

Eigenmannia key to Venezuelan species, SCHULTZ 382 p. 61; *E. goajira* sp. nov. Rio Socuy, Venezuela, SCHULTZ 382 p. 63 fig.

Sternarchogiton cuchillejo sp. nov. Río Motatán, Venezuela, SCHULTZ 382 p. 72 fig.

Sternopygus key to species, SCHULTZ 882 p. 58; *S. pejeraton* sp. nov. Río Apón, Venezuela, SCHULTZ 882 p. 60 fig.

CATOSTOMIDAE

Camptostoma anomalum pullum, life history and culture, DOBIE, MEEHEAN & WASHBURN 256.

Catostomus c. commersonii, life history and culture, DOBIE, MEEHEAN & WASHBURN 256.

Megastomatolus cyprinella from California, EVANS 272.

CYPRINIDAE

Habits and culture of several North American species, DOBIE, MEEHEAN & WASHBURN 256.

Macroscopic structure of scales of some species of Manchuria, MATSUI 647.

Abramis brama, SEGERSTRÅLE 895; spawning habits, SVÄRDSON 952.

Acanthobrama marmidorontis subsp. nov. Antiokhia lake—Oront reservoir, BERG 88 p. 839.

Catla catla bionomics, CHACKO & KURIYAN 188.

Ctenopharyngodon idellus, influence of sex hormones on gonads, KAWAMOTO 529; Digestion of higher carbohydrates, MIGITA & HASHIMOTO 666.

Culter erythropterus description of skeleton, TCHANG 978.

Cyprinus carpio, culture and breeding in Japan, MATSUI 646; Study of relative growth, HAMAI 394; serological analysis of different races, TALIEV 967.

Diptychus dybowskii recorded from Irtysh river, Siberia, MENSCHIKOW 662.

Garra rufa gymnothorax subsp. nov. Tiger river, BERG 88 p. 792 figs.

Gila jordani sp. nov. Pahranaagat Valley, Nevada, TANNER 972 p. 32 fig.

Gobio species of Amur basin, NIKOLSKI 736; *G. belingi*, *G. kessleri* in Czechoslovakia, OLIVA 749; *G. kessleri*, in Moravia, OLIVA 747.

Iranocypris gen. nov. p. 4 type *I. typhlops* sp. nov. Iran p. 5, BRUNN & KAISER 131.

Labeo boggrut sexual dimorphism, MISRA 675; *L. gonius* distribution, bionomics and development, MOOKERJEE & GANGULY 685.

Lavinia exilicauda exilicauda bionomics, MURPHY 705.

Leuciscus erythrophthalmus spawning habits, SVÄRDSON 952; *L. idus*, SEGERSTRÅLE 895; *L. rutilus*, SEGERSTRÅLE 899.

Mesocyprinus gen. nov. p. 568 type *Cyprinus micristius* Regan p. 569, CHENG 194.

Nocomis biguttatus, *N. micropogon* comparison of feeding habits, LACHNER 573.

Pelecus cultratus, structure and function of pectoral fins and muscles, RAUTHER 820.

Phoxinellus callensis note on distribution, DIEUZEIDE & CHAMPAGNE 251.

Rutilus rutilus × *Leuciscus danilewski* artificially bred hybrid, NIKOLJUKIN 735 see also *Leuciscus*.

†*Soricidens haueri* ref. to *Leuciscus* WEINFURTER 1031.

Thynnichthys sandkhol bionomics, CHACKO & GANAPATI 183.

Tinca tinca morphology, TRETIAKOV 994.

COBITIDAE

Cobitis isolating factors in local races, MINAMORI 672; Hormonically induced ovulation, KAWAMURA & MOTONAGA 530; *C. aurata* in Moravia, OLIVA 748.

Lepidocephalus thermalis bionomics, CHACKO 179.

Misgurnus fossilis influence of temperature fluctuations on embryonic development, PERSOV 775; From burrow of desman, Russia, BARABASH-NIKIFOROV 59.

Nemachilus trauchi zaisanicus, *N. s. ulacholica* recorded from Irtysh river, Siberia, MENSCHIKOW 662.

HOMALOPTERIDAE

Pseudogastromyzon cheni sp. nov. Changting, Fukien, LIANG 599 p. 4 fig.; *P. fasciatus changtingensis* subsp. nov. Changting, Fukien, LIANG 599 p. 1 fig.

SILUROIDEA

Review of species in Hamilton's "Gangetic fishes", HORA 450.

ARIIDAE

Arius skull illust. and account of habits, BERRILL 89.

Tachysurus (?) †*landanensis* **sp. nov.** Eocene Congo, p. 214 pl. xvii figs. 9-11; *T.* (?) †*malembeensis* **sp. nov.** Miocene Congo, p. 215 pl. xxii fig. 7, DARTEVELLE & CASIER 229.

DORADIDAE

Autanadoras milesi **gen. et sp. nov.** Rio Autana, Venezuela, FERNANDEZ-YEPEZ 286 p. 8 fig.

SILURIDAE

Callichrous pabo recorded from Tungabhadra river, India, CHACKO & MATHEWS 190.

Silurus glanis introduced in England, GLEGG 357.

AMEIURIDAE

Habits and culture of certain species, DOBIE, MEEHEAN & WASHBURN 256.

Ictalurus lacustris punctatus specimen with forked barbel, NEILL 726.

Istlaris balsanus occidentalis **subsp. nov.** Rio Huamito en La Huacana, Mexico, BUEN 136 p. 119.

Schilbeodes hildebrandi **sp. nov.** Homochitto River, Mississippi, BAILEY & TAYLOR 53 p. 32 figs.

CLARIIDAE

Clarias batrachus bionomics, MOOKERJEE & MAZUMDAR 687; SOONG MIN KONG 926.

Heteropneustes fossilis effect of sex hormones on reproductive system of ♀, KAR & GHOSH 522.

SISORIDAE

Glyptosternon malaisiei **sp. nov.**, Kam-baiti, N.E. Burma, RENDAHL & VESTERGREN 825 p. 213.

Glyptothorax telchitta structure of adhesive apparatus, BHATIA 94; *G. cavia*, redescribed, HORA & MENON 452.

PIMELODIDAE

Pimelodella cruzenti **sp. nov.** Rio Autana, Venezuela, FERNANDEZ-YEPEZ 286 p. 5 fig.; *P. parva* **sp. nov.** R. Paraguay, GÜNTERT 388 p. 34 figs.

Pimelodus botius Hamilton a synonym of *Glyptothorax telchitta*, HORA & MENON 452.

Pseudopimelodus acanthochiroides **sp. nov.** Santander, Colombia, GÜNTERT 388 p. 29.

Rhamdia sebae martyi **subsp. nov.** Riactis Canawé, Paraguay, GÜNTERT 388 p. 33.

BUNOCEPHALIDAE

Bunocephalus minutus **sp. nov.** Paraguay, GÜNTERT 388 p. 28 fig.

CALLICHTHYIDAE

Brochis caeruleus, fig., INNES 469.

APODES

Development of eggs and larvae from Gulf of Manaar, NAIR & BHIMACHER 714.

ANGUILLIDAE

Anguilla anguilla movements in the Baltic Sea, MÄÄR 613; Age-length relationship, FROST 331; Sex differentiation, SVÄRDSON 956; Notes on occurrence of partially ripe specimens in Sweden, SVÄRDSON 957; Ability to form antitoxins related to its reproductive activities, CALLAMAND 150; Investigations on tumor disease, CHRISTIANSEN & JENSEN 198.

MURAENIDAE

Fimbrinares mosaica **gen. et sp. nov.** Botany Bay, N.S.W., WHITLEY 1047 p. 72.

Gymnothorax key to Venezuelan species, SCHULTZ 382 p. 77; *G. meleagris*, *G. macrocephalus*, *G. marmorata* from Christmas Island, Indian Ocean, PALMER 765; *G. petelli*, *G. flavimarginatus* from Cocos-Keeling Islands, MARSHALL 631.

Lycodontis longinquus **sp. nov.** N. Mackay, Queensland, WHITLEY 1047 p. 73.

Muraena picta from Christmas Island, Indian Ocean, PALMER 765.

SERRIVOMERIDAE

Bertinulus **gen. nov.** p. 73 type *Oxystomus hyalinus* Rafinesque, WHITLEY 1047 p. 73.

NEMICHTHYIDAE

Nemichthys discussion of species complex, BÖHLKE 110; *N. fronto* from Southern California waters, BÖHLKE 110.

CONGRIDAE

Bassanago bulbiceps **gen. et sp. nov.** Bass Strait, Victoria, WHITLEY 1047 p. 71 fig.

ECHELIDAE

Kaupichthys diodontus osteology and relationships, GOSLINE 367.

Muraenichthys macropterus, *M. gymnotus* from Cocos-Keeling Islands, MARSHALL 631.

SYNENTOGNATHI

BELONIDAE

Key to genera and species from Venezuela, SCHULTZ 882 p. 79.

Belone platyura from Cocos-Keeling Islands, MARSHALL 631.

Strongylura annulatus from Christmas Island, Indian Ocean, PALMER 765.

SCOMBRESOCIDAE

Cololabis saira trans-Pacific distribution, SCHAEFER & REINTJES 866.

HEMIRHAMPHIDAE

Hemirhamphus balinensis from Cocos-Keeling Islands, MARSHALL 631.

EXOCEOTIDAE

Notes on flight, TORTONESE 991.

Cypsilurus atrisignis, *C. cyanopterus* from Cocos-Keeling Islands, MARSHALL 631; *C. oxycephalus* from Christmas Island, Indian Ocean, PALMER 765.

MICROCYPRIINI

CYPRINODONTIDAE

Key to Venezuelan genera and species, SCHULTZ 882 p. 81.

Xenodexiinae subfam. nov., HUBBS 456 p. 5.

Anableps anableps skeletal structure of gonopodium, TURNER 1000.

Austrofundulus stagnalis sp. nov. Río Misoa, Venezuela, SCHULTZ 882 p. 88 fig.; *A. transilis limnaeus* subsp. nov. Río Cocuiza, Venezuela, SCHULTZ 882 p. 85 fig.

Curtipenis gen. nov. type *Mollienisia elegans* Trewavas, RIVAS & MYERS 831 p. 289 fig.

Cynopoeilus colour notes on an unnamed species, LADIGES 576.

Cyprinodon speciation, MILLER 668.

Empetrichthys speciation, MILLER 668.

Epiplatys matlocki p. 3 figs.; *E. melantereon* p. 5 figs. spp. nov. Robertsport, Liberia, FOWLER 312.

Gambusia aestiputius sp. nov. St. Andrew Island, W. Indies, FOWLER 313 p. 87 figs.; *G. lemaitrei* sp. nov. Totumo lake, Colombia, FOWLER 311 p. 2 figs.

Goodea atripinnis key to subspecies BUEN 136; *G. a. martini* subsp. nov. rio Grande de Morelia, Mexico, BUEN 136 p. 100.

Hubbsichthys gen. nov. p. 95 type *H. laurae* sp. nov. Estado de Trujillo, Venezuela, p. 96 fig., SCHULTZ 882.

Mollienisia corrected spelling for *Mollienisia*, BAILEY & MILLER 52.

Mollienisia sulphuraria sp. nov. sulphur springs in Tabasco, Mexico, ALVAREZ 25 p. 276 figs. 1 and 2.

Poecilia veti-providentiae sp. nov. Old Providence Island, W. Indies, FOWLER 313 p. 77 figs.

Profundulus hildebrandi sp. nov. Chiapas, Mexico, MILLER 667 p. 22 fig.

†*Prolebias* cf. *gregatus* from Oligocene Spain, BAUZÁ RULLÁN 71.

Rivulus bondi sp. nov. Caracas, Venezuela, SCHULTZ 882 p. 92 fig.

Xenodexia gen. nov. p. 8 type *X. ctenolepis* sp. nov. Guatemala p. 9 figs., HUBBS 456.

Xiphophorus helleri masculinisation of ♀ by use of X-rays, VIVIEN 1014.

SOLENICHTHYES

AULOSTOMATIDAE

Aulostoma valentini from Christmas Island, Indian Ocean, PALMER 765.

FISTULARIIDAE

Fistularia petimba from Cocos-Keeling Islands, MARSHALL 631.

MACRORHAMPHOSIDAE

Macroramphosus scolopax from Danish waters, BLEGGVAD 109.

CENTRISCIDAE

Amphisila tteleajensis sp. nov. Oligocene Roumania, JONET 505 p. 161; and 506 p. 361 fig. 1.

SYNGNATHIDAE

Notes on specimens in Vienna Museum, KÄHSBAUER 513.

Key to Venezuelan genera and species, SCHULTZ 882.

Campichthys tryoni lindemanensis
subsp. nov. Lindeman Isl., Queensland,
WHITLEY 1047 p. 78.

Choerichthys sculptus from Cocos-
Keeling Islands, MARSHALL 631.

Filicampus gen. nov. orthotype
Syngnathus superciliaris Gunther,
Whitley 1047 p. 75.

Hippocampus, breeding illustrated,
HESS 427; *H. trimaculatus* from Cocos-
Keeling Islands, MARSHALL 631.

Histiogamphelus maculatus robensis
subsp. nov. Robe, S. Australia, WHITLEY
1047 p. 76.

Hypselognathus gen. nov. orthotype
Histiogamphelus rostratus Waite and
Hale, WHITLEY 1047 p. 76.

Ichthyocampus parvnei sp. nov.
Guen Cay, Bahamas, HERALD 420 p.
269.

Larvicampus gen. nov. orthotype
Festucalex (*Campichthys*) *runa* Whitley,
WHITLEY 1047 p. 75.

Maroubra perserrata gen. et sp. nov.
Maroubra beach, Sydney, WHITLEY
1047 p. 74 fig.

Mitotichthys gen. nov. orthotype
Syngnathus tuckeri Scott, WHITLEY
1047 p. 75.

Nerophis lumbriciformis breeding fe-
male, GÜLER 386.

Parasyngnathus wardi Lindeman Isl.,
Queensland p. 77, *P. howensis* Lord
Howe Is. p. 77 spp. nov., WHITLEY 1047.

Pugnaso gen. nov. orthotype *Syngna-
thus curtirostris* Castelnau, WHITLEY
1047 p. 75.

Stipecampus gen. nov. orthotype
Ichthyocampus cristatus McCulloch and
Waite, WHITLEY 1047 p. 75.

ANACANTHINI

Tripteryphiidae fam. nov., WHITLEY
1047 p. 79.

MACROURIDAE

Chalinura murrayi europaea subsp.
nov. N.E. Atlantic., NYBELIN 743 p. 61
figs.

Phalacromacrurus gen. nov. p. 971
type; *P. pantherius* sp. nov. "Michael
Sars" Exped. St. 53, N.E. Atlantic
p. 972 fig., MAUL & KOEFOED 652.

MERLUCCIIDAE

Macruronus capensis sp. nov. off Cape
Town, DAVIES 232 p. 512 fig.

Merlangius for *Merluccius*, WHITLEY
1047 p. 83.

GADIDAE

Bregmaceros revision and distribution
with key to species, MUNRO 701; *B.*
sp. rec. Oligocene Rumania JONET 507;
B. rarisquamosus sp. nov. Bostrem Bay,
New Guinea, MUNRO 701 p. 39 fig.

Gadus callarias otolith from Quater-
nary W. Greenland, LAURSEN 585; *G.*
macrocephalus from N. California,
PHILLIPS 782; *G. minutus* bionomics,
MENON 661; *G. morrhua* bionomics,
KÄNDLER 519; Abundant off W. Green-
land early 19th cent., JENSEN 491,

Mora dannevigii sp. nov. Gt. Austr-
alian Bight Long. 129° 28' E., WHITLEY
1047 p. 82 fig.

Phycis blennoides age and growth,
HART 410.

Tripteryphycis intermedius sp. nov.
South of Eucla, Gt. Australian Bight,
WHITLEY 1047 p. 79 fig.

ALLOTRIOGNATHI

LAMPRIDIDAE

Lampris guttatus, distribution and
habits ORKIN 760; *L. regius* Australa-
sian distributional records, WHITLEY
1050.

TRACHYPTERIDAE

Regalicus glesne, description of a speci-
men from G. of Genoa, GUIGLIA 385.

BERYCOMORPHI

DIRETMIDAE

Paradiretmus gen. nov. p. 83 type;
P. circularis sp. nov. Lord Howe Island
p. 84 fig., WHITLEY 1047.

TRACHICHTHYIDAE

Hoplostethus tingsens otolith figd. from
Pliocene of Spain, MELÉNDEZ 658.

HOLOCENTRIDAE

Holocentrum caudimaculatum, *H. mic-
rostoma*, *H. tiereoides* from Christmas
Island, Indian Ocean, PALMER 756; *H.*
lacteoguttatum from Cocos-Keeling Is-
lands, MARSHALL 631.

Holotrachys major sp. nov. N.S. Wales,
WHITLEY 1054 p. 33 fig.

Myripristis murdjan from Christmas
Island, Indian Ocean, PALMER 765.

ZEOMORPHI

CAPROIDAE

Antigonia key to species with notes, FRASER-BRUNNER 320.

Capros aper systematic position and affinities, TORTONESE 986; From Irish coast, WENT 1039.

PERCOMORPHI

PERCOIDEA

SERANIDAE

Acropoma luminous organs, HANEDA 398.

Anyperodon leucogrammicus from Cocos-Keeling Islands, MARSHALL 631.

Aporops bilinearis from Cocos-Keeling Islands, MARSHALL 631.

Archeria gen. nov. p. 5 type, *A. jamesonoides* sp. nov. p. 6 Archer river, Cape York, Australia, NICHOLS 728.

Chelidoperca hirundinacea recorded from Philippines, HERRE 422.

Epinephelus aeneus, *E. gigas* otoliths, SANZ-ECHVERRIA 857; *E. caninus* size and weight of specimen from Ebro delta, Spain, ANDREU 36; *E. corallicola*, *E. tauvina*, *E. danielii*, *E. boenack* from Cocos-Keeling Islands, MARSHALL 631; *E. merra* from Christmas Island, Indian Ocean, PALMER 765; *E. thompsoni* sp. nov. N.E. of Cape Moreton, Queensland, WHITLEY 1047 p. 89.

Grammistes seolineatus from Cocos-Keeling Islands, MARSHALL 631.

Lepibema chrysops growth rate, LEWIS 596.

Percichthys trucha population study, MACDONAGH 617.

Plectropoma maculatum from Cocos-Keeling Islands, MARSHALL 631.

Pseudogramma polyacanthus from Cocos-Keeling Islands, MARSHALL 631.

Serranus atricauda from Mediterranean, DIEUZEIDE 249.

Therapon percoides yorkensis subsp. nov. Archer river, Cape York, Australia, NICHOLS 728 p. 3.

PLESIOPIDAE

Plesiops melas from Cocos-Keeling Islands, MARSHALL 631.

KUHLIIDAE

Kuhlia taeniura from Cocos-Keeling Islands, MARSHALL 631; From Christmas Island, Indian Ocean, PALMER 765.

CENTRARCHIDAE

Measurement of condition in six species of Michigan, BECKMAN 77.

Growth and sex-ratio in six species of Michigan, BECKMAN 78.

Archoplites interruptus bionomics, MURPHY 704.

Mesogonistius chaetodon elizabethae notes on distribution, REID 823.

Micropterus salmoides floridanus food, McLANE 622.

PRIACANTHIDAE

Priacanthus cruentatus from Christmas Island, Indian Ocean, PALMER 765.

CHEILODIPTERIDAE

Apogon avaritus, *A. frenatus*, *A. melas*, *A. leptacanthus* from Cocos-Keeling Islands, MARSHALL 631; *A. imberbis* reproduction and oral incubation of eggs, GARNAUD 345; Breeding habits, GARNAUD 346; *A. marginatus* luminous organ, Haneda 398.

Epigonus denticulatus sp. nov. Mediterranean, DIEUZEIDE 248 p. 89 figs.

PERCIDAE

Acerina notes on European species, with key, MOHR 679.

Hololepis barratti appalachia subsp. nov. Bent Creek, N. Carolina, BAILEY 51 p. 312.

Perca flavescens bionomics, PARSONS 768; Growth and sex-ratio, BECKMAN 78; Length-weight relationships, BECKMAN 77; *P. fluviatilis* reasons for occurrence of stunted populations, ALM 18.

Poeciliichthys parvipinnis reasons for validity of this name, MOORE & CROSS 691.

Stizostedion vitreum, life-history, ESCHMEYER 271.

POMATOMIDAE

Pomatomus saltatrix otoliths, SANZ-ECHVERRIA 857.

CARANGIDAE

Distribution and abundance of Indonesian species, HARDENBERG 400.

Key to Venezuelan genera and species, SCHULTZ 882.

Caranx melampygus, *C. ferdau* from Cocos-Keeling Islands, MARSHALL 631.

Decapterus key to species, BERTIN & DOLLFUS 92; *D. normani* sp. nov. Madagascar, BERTIN & DOLLFUS 92 p. 21 fig.

Hildebrandella gen. nov. type *Citula halli* Evermann and Seale, NICHOLS 730 p. 20 fig.

Juvenella carangoides gen. et sp. nov. Newport, Sydney, N.S.W., WHITLEY 1047 p. 90 fig.

Lichia vadiago otoliths, SANZ-ECHVERRIA 857.

Naucrates ductor photos showing association with *Manta*, HASS 412.

Oligoplites key to W. Atlantic species, SCHULTZ 882.

Regificola parilis sp. nov. Mooloolabah, Queensland, WHITLEY 1047 p. 91 fig.

Scomberoides toloparah from Cocos-Keeling Islands, MARSHALL 631.

Trachinotus key to Venezuelan species SCHULTZ 882; *T. bailloni* from Cocos-Keeling Islands, MARSHALL 631; From Christmas Island, Indian Ocean, PALMER 765.

Trachurus picturatus australis subsp. nov. Quequen, Atlantic, NANI 720 p. 178 fig.; *T. trecae* sp. nov. Senegal Coast, S. Africa, CADENAT 148 p. 668 fig.

BRAMIDAE

Brama raii occurrence in North Sea, KRISTENSEN 561.

CENTROPOMIDAE

Centropomus key to Venezuelan species, SCHULTZ 882.

Denariusa bandata gen. et sp. nov. Arnheim Land, N. Territory, Australia, WHITLEY 1047 p. 92 fig.

ARRIPIDIDAE

Arripis trutta raciation, FAIRBRIDGE 278.

LUTIANIDAE

Aphareus furcatus from Cocos-Keeling Islands, MARSHALL 631; From Christmas Island, Indian Ocean, PALMER 765.

Lutianus bohar, *L. kasmira*, *L. niger* from Cocos-Keeling Islands, MARSHALL 631; *L. vaigiensis* from Christmas Island, Indian Ocean, PALMER 765.

Rhomboplites aurorubens spawning records off N. Carolina, WALKER 1026.

LEIOGNATHIDAE

Luminous organs, HANEDA 398.

Key to W. Indian genera and species, SCHULTZ 882.

Diapterus key to Venezuelan species, SCHULTZ 882; *D. limnaeus* sp. nov. L. Maracaibo, Venezuela, SCHULTZ 882 p. 142 fig.

Eucinostomus sciasemion sp. nov. Old Providence Island, W. Indies, FOWLER 313 p. 80 figs.

Eugerres key to Venezuelan species, SCHULTZ 882; *E. aulae* sp. nov. Maracaibo, Venezuela, SCHULTZ 882 p. 147 fig.

POMADASYIDAE

Key to Venezuelan genera, SCHULTZ 882.

Haemulon key to Venezuelan species SCHULTZ 882.

Parapristipoma mediterraneum otoliths, SANZ-ECHVERRIA 857.

Plectorhynchus chaetodonoides from Cocos-Keeling Islands, MARSHALL 631.

Pomadasy operculare compared with *P. suillus* with distributional notes, SMITH 922.

SCIAENIDAE

Key to Venezuelan genera and species, SCHULTZ 882.

Aplodinotus grunniens, growth, BUTLER & SMITH 145.

Collichthys notes on species, NICHOLS 729; *C. novaeguineae* sp. nov. Mearauke river, New Guinea, NICHOLS 729 p. 2.

Cynoscion key to Venezuelan species, SCHULTZ 882; *C. maracaiboensis* sp. nov. L. Maracaibo, Venezuela, SCHULTZ 882 p. 160 fig.; *C. nebulosus* bionomics, MOODY 683.

†*Eocliphodus* gen. nov. type *E. lerichei* sp. nov. Cretaceous Congo, DARTEVELLE & CASIER p. 226 text-fig. 67B pl. xviii 229.

Pareques acuminatus recorded from Texas waters, BAUGHMAN 69.

Plagioscion squamosissimus, food, OLIVEIRA E SILVA & MENEZES 751.

Pseudosciaena manchurica bionomics, MATSUI & TAKAI 649.

Sciaena aquila otoliths, SANZ-ECHEVERRIA 857; *S. mbizi* sp. nov. African Coast, S. Atlantic, POLL 790 p. 8 fig.

Umbrina ronchus otoliths, SANZ-ECHEVERRIA 857.

MULLIDAE

Notes on species of Mauritius, BAISSAC 54.

Mulloidichthys samoensis from Cocos-Keeling Islands, MARSHALL 631.

Mullus barbatus bionomics, BORISSENKO 116; *M. b. forma typica* bionomics, ANANIADIS 30; *M. surmuletus*. *M. barbatus* differences between these species, BOUGIS 117.

Parupeneus bifasciatus, *P. trifasciatus*, *P. chryserydros* from Cocos-Keeling Islands, MARSHALL 631.

Upeneus arge from Cocos-Keeling Islands, MARSHALL 631.

LETHRINIDAE

Lethrinus hypslepterus, *L. microdon*, *L. rhodopterus* from Cocos-Keeling Islands, MARSHALL 631.

Monotaxis grandoculis from Cocos-Keeling Islands, MARSHALL 631.

SPARIDAE

Key to Venezuelan genera and species, SCHULTZ 882.

Box, *Diplodus* and *Pagellus* figd., L. Pliocene Majorca BAUZÁ RULLÁN 75.

Box boops from Danish waters, BONDESEN 113; New record for Norwegian waters, HOLGERSEN 442.

Calamus calamus spawning records off N. Carolina, WALKER 1026.

Pagrus †*mauritanicus* figd. from Pliocene Majorca, BAUZÁ RULLÁN 72; *P. pagrus* spawning records off N. Carolina, WALKER 1026.

Sparus auratus observations on hermaphrodites, ANCONA 32; PASQUALI 769; *S. †cinctus* figd. from Miocene Majorca, BAUZÁ RULLÁN 72; *S. †neogenus* figd. from Miocene Majorca, BAUZÁ RULLÁN 72.

†*Trigonodon oweni* figd. Miocene Majorca, BAUZÁ RULLÁN 72.

PEMPHERIDAE

Pempheris otaitensis from Christmas Island, Indian Ocean, PALMER 765.

EPHIPPIDAE

Platax teira from Christmas Island, Indian Ocean, PALMER 765.

CHAETODONTIDAE

Anisochaetodon falcula, *A. kleini*, *A. vagabundus*, *A. rafflesi* from Cocos-Keeling Islands, MARSHALL 631.

Chaetodon citrinellus from Christmas Islands, Indian Ocean, PALMER 765; *C. lunula* from Cocos-Keeling Islands, MARSHALL 631; *C. (Oxychaetodon) marcellae* sp. nov. S. Atlantic, off African coast, POLL 790 p. 2 fig.; *C. (Rhabdophorus) melapterus* figd., FRASER-BRUNNER 323.

Forcipiger longirostris from Christmas Island, Indian Ocean, PALMER 765.

Gonochaetodon larvatus figd., FRASER-BRUNNER 323.

Holacanthus (Apolemichthys) xanthotis sp. nov. Mukalla Bay, S. Arabia, FRASER-BRUNNER 323 p. 43 fig.

Pomacanthus imperator from Cocos-Keeling Island, MARSHALL 631; From Christmas Island, Indian Ocean, PALMER 765.

CICHLIDAE

Ethology, BAERENDS & BAERENDS 48; Origin and evolution of species from African lakes, TREWAVAS 995.

Key to Venezuelan genera, SCHULTZ 882.

Aequidens key to Venezuelan species, SCHULTZ 882; Interspecific mating in aquarium, KLEIN & DEMBROW 549.

Cichla notes on breeding and reproduction, FONTENELE 303.

Cichlasoma hellabrunni sp. nov. British Guiana, LADIGES 575 p. 199 fig. *C. hogaboomorum* p. 27 fig., Rio Choluteca, Honduras, *C. popenoei* p. 31 fig., Rio Yeguaré, Honduras, spp. nov., CARR & GIOVANNOLI 155; *C. istlana fusca* subsp. nov. Rio Huamito en la Huacana, Mexico, BUEN 136 p. 121.

Crenicichla key to Venezuelan species, SCHULTZ 882.

Hemichromis bimaculatus breeding habits and social behaviour, PETERS 776.

Pterophyllum key to Venezuelan species, SCHULTZ 882.

Spathodus marlieri sp. nov. Uvira, L. Tanganyika, POLL 791 p. 294 figs.

Tanganicodus irsacae gen. et sp. nov. Uvira, L. Tanganyika, POLL 791 p. 297 figs.

Tilapia mossambica, food, HOFSTEDE & BOTKE 441.

CEPOLIDAE

Cepola pauciradiata sp. nov., Senegal coast, W. Africa, CADENAT 148 p. 663 fig.

CIRRHITIDAE

Amblycirrhitus forsteri, *A. arcatus*, *A. hemistictus* from Cocos-Keeling Islands, MARSHALL 631.

Cirrhitus pinnulatus from Cocos-Keeling Islands, MARSHALL 631.

Cirrhitus key to species, SCHULTZ 886; *C. albopunctatus* p. 548 fig., *C. nigropunctatus* p. 549 fig., *C. spilotoceps* p. 551 fig. spp. nov. Marshall Islands, SCHULTZ 886.

POMACENTRIDAE

Abudefduf saxatilis, *A. notatus* from Christmas Island, Indian Ocean, PALMER 765; *A. septemfasciatus*, *A. notatus*, *A. glaucus*, from Cocos-Keeling Islands, MARSHALL 631.

Chromis caeruleus from Cocos-Keeling Islands, MARSHALL 631; *C. lineatus* sp. nov. Senegal coast, W. Africa, CADENAT 148 p. 669 fig.

Dascyllus trimaculatus from Cocos-Keeling Islands, MARSHALL 631.

Pomacentrus pavo from Cocos-Keeling Islands, MARSHALL 631.

LABRIDAE

Anampses diadematus from Cocos-Keeling Islands, MARSHALL 631.

Callyodon laxtoni sp. nov. Ocean Island, WHITLEY 1047 p. 94.

Cheilinus fasciatus, *C. undulatus* from Cocos-Keeling Islands, MARSHALL 631.

Cheilio inermis from Cocos-Keeling Islands, MARSHALL 631.

Choerodon key to Philippine species, HERRE 422; *C. balerensis* sp. nov. Luzon, Philippines, HERRE 422 p. 149.

Gomphosus coeruleus from Cocos-Keeling Islands, MARSHALL 631; *G. tricolor* from Christmas Island, Indian Ocean, PALMER 765.

Halichoeres centiquadrus, *H. notopis*, *H. margaritaceus* from Cocos-Keeling Islands, MARSHALL 631.

Hemipteronotus taeniurus from Cocos-Keeling Islands, MARSHALL 631.

Macropharyngodon meleagris from Cocos-Keeling Islands, MARSHALL 631.

Pseudocheilinus hexataenia from Cocos-Keeling Islands, MARSHALL 631.

†*Pseudoeogertonia* gen. nov. type. *P. straeleni* sp. nov. Eocene Congo p. 230 pl. xix fig. 7; *P. bebianoi* sp. nov. Eocene Congo p. 230 pl. xix figs. 2-9, DARTEVELLE & CASIER 229.

Pseudojulis notospilus from Christmas Island, Indian Ocean, PALMER 765.

Pseudojuloides gen. nov. type *Pseudojulis cerasina* Snyder, FOWLER 309 p. 119.

Stethojulis axillaris, *S. strigiventer* from Cocos-Keeling Islands, MARSHALL 631; *S. strigiventer* from Christmas Island, Indian Ocean, PALMER 765.

Thalassoma hardwicki from Christmas Island, Indian Ocean, PALMER 765; *T. hardwicki*, *T. güntheri*, and *T. lunare* from Cocos-Keeling Islands, MARSHALL 631.

SCARIDAE

Key to genera and species with one row of scales on cheek, HARRY 409.

Leptoscarus vaigiensis from Cocos-Keeling Islands, MARSHALL 631.

Pseudoscarus janthochir from Cocos-Keeling Islands, MARSHALL 631.

Scarus dubius, *S. oviceps*, *S. forsteri*, *S. rubroviolaceus*, *S. viridibuscus* from Cocos-Keeling Islands, MARSHALL 631.

Xenoscarus hubbsi sp. nov. Bocochibampo Bay, Mexico, HARRY 409 p. 147 figs.

AMMODYTIDAE

Ammodytes propagation, growth and variation in Baltic and North Sea species KÄNDLER 517; *A. lanceolatus*, *A. lancea* differences between, FOREST 306.

Gymnammodytes semisquamatus distribution and vertebral counts, *G. cicereus*, *G. capensis*, vertebral counts, CORBIN 213.

PINGUIPEDIDAE

Parapercis tetracanthus, *P. hexophthalma* from Cocos-Keeling Islands, MARSHALL 631.

Pinguipes chilensis stomach contents, BAHAMONDE 50.

TRACHINIDAE

Trachinus poison glands, DATHE 230.

BEMBROPSIDAE

Bathypercis platyrhynchus = *Bembrops caudimacula*, KURODA 571.

Bembrops caudimacula, distribution, synonymy, KURODA 571.

Hypsicometes gobioides = *Bembrops caudimacula*, KURODA 571.

ACANTHUROIDEA

ZANCLIDAE

Zanclus canescens from Cocos-Keeling Islands, MARSHALL 631.

ACANTHURIDAE

Acanthurus guttatus, *A. glaucopareis* from Cocos-Keeling Islands, MARSHALL 631; *A. guttatus*, *A. triostegus*, *A. glaucopareis* from Christmas Island, Indian Ocean, PALMER 765.

Ctenochaetus strigosus from Christmas Island, Indian Ocean, PALMER 765.

Naso brevirostris from Cocos-Keeling Islands, MARSHALL 631.

Teuthis puella, *T. rostratus* from Cocos-Keeling Islands, MARSHALL 631.

SIGANOIDEA

SIGANIDAE

Siganus hexacanthus sp. nov. Lizard Island, Gt. Barrier Reef, BARTON 66 p. 1 fig.

TRICHIUROIDEA

GEMPYLIDAE

Lepidocybium flavo-brunneum systematic position, synonymy and distribution, MUNRO 702.

Nesiarchus nasutus distribution, FOREST & LEGENDRE 308.

Nesogrammus thompsoni Fowler a synonym of *Lepidocybium flavo-brunneum*, MUNRO 702.

Thyrstites atun bionomics, distribution and fishery, BLACKBURN 103.

Thyrstites violaceus a synonym of *Nesiarchus nasutus*, FOREST & LEGENDRE 308.

Xenogramma carinatum Waite a synonym of *Lepidocybium flavo-brunneum*, MUNRO 702.

TRICHIURIDAE

Aphanopus carbo food of and fishery, TUCKER 999.

†*Eutrichiurides africanus* sp. nov. Eocene Congo, DARTEVELLE & CASIER 229 p. 241 pl. xxii fig. 2; *E. winkleri* figd., CASIER 157.

Tentoriceps gen. nov. orthotype *Trichiurus cristatus* Klunzinger, WHITLEY 1047 p. 94.

Trichiurus haumela bionomics, PRABHU 798; *T. toshosunensis* figd. and rec. Eocene Congo, Angola, DARTEVELLE & CASIER 229.

SCOMBROIDEA

SCOMBRIDAE

Key to subfamilies, FOREST & LEGENDRE 308; Suggested classification with key to genera and species, FRASER-BRUNNER 319.

Key to Venezuelan genera, SCHULTZ 882.

Distribution and abundance of Indonesian species, HARDENBERG 400; bionomics of some Pacific genera, SCHAEFER 865.

Auxis thazard, *A. tapeinosoma* juveniles and adults described and compared, WADE 1019.

Cybius tangustidens sp. nov. Eocene Congo, DARTEVELLE & CASIER 229 p. 238 pl. xix figs. 14, 15.

Eurhynchus lineatus recorded from Santa Barbara Island, S. California, ROEDEL 835; *E. yaito* probable spawning season, WADE 1020.

Katsuwonus pelamis description of juvenile forms from Hawaiian waters, ECKLES 265; Spawning season, WADE 1020.

†*Landanichthys* gen. nov. type *L. lusitanicus* sp. nov. Eocene Congo p. 232 text-fig. 68 pl. xxi fig. 1; *L. moutai* sp. nov. Eocene Congo p. 234, text-fig. 69, pl. xix fig. 10, pl. xxi fig. 2, pl. xxii fig. 3, DARTEVELLE & CASIER 229.

Neothunnus biometric comparison between Atlantic and Pacific species, SCHAEFER & WALFORD 867; *N. macropterus* notes on spawning season, WADE 1020.

Orcynus germon from Irish coast, WENT 1039.

Scomberomorus key to species of Venezuelan coast, SCHULTZ 882; *S. concolor* from S. California, FITCH 289; *S. maculatus* otoliths, SANZ-ECHEVERRIA 857; *S. sierra* description of juvenile forms from Hawaiian waters, ECKLES 265.

†*Selota* **nom. nov.** for †*Zelotes* Jordan & Gilbert 1920 non Gistel 1848, STRAND p. 401 [= *Zelotichthys* Jordan 1925] 946.

†*Sphyrænodus lerichei* figd., CASIER 157.

Thunnus maccoyii a valid species, GODSIL & HOLMBERG 359; *T. thynnus* eastern and western Atlantic forms compared with each other and with *T. orientalis*, GODSIL & HOLMBERG 359.

LUVARIDAE

Luvaris imperialis recorded from Pt. St. George, California, RIPLEY 829; From Irish coast, WENT 1039.

ISTIOPHORIDAE

Makaira mitsukurii notes on body temperature, MORROW & MAURO 696.

Tetrapterus mazara specimen without spear, MOORE 693.

XIPHIIDAE

†*Congorhynchus* **gen. nov.** type *C. trabeculatus* **sp. nov.** Maastrichtian Congo, DARTEVELLE & CASIER 229 p. 247 text-figs. 73B, 74, pl. xx figs. 10–13, 16.

†*Cylindracanthus rectus* **var. landanensis** **var. nov.** Eocene Congo p. 245 pl. xx figs. 8, 14; *C. rectus* rec. from Eocene Congo & Angola; *C. cf. gigas* rec. from Eocene Congo, DARTEVELLE & CASIER 229.

†*Hemirhabdorrhynchus brevirostris* **sp. nov.** Eocene Congo p. 246 text-fig. 72 pl. xx fig. 5, DARTEVELLE & CASIER 229.

Xiphias gladius from Texas coast, KRAMER 560.

†*Xiphiorhynchus subcostatus* **sp. nov.** Eocene Congo, DARTEVELLE & CASIER 229 p. 242 text-fig. 70 pl. xx fig. 2.

GOBIOIDEA

Glossohyal bone, TAKAGI 963.

ELEOTRIDAE

Bunaka gyronoides from Christmas Island, Indian Ocean, PALMER 765.

Eleotris aurea **sp. nov.** Murchison river, W. Australia, SHIPWAY 911 p. 75 figs.

Eviota epiphanes from Christmas Island, Indian Ocean, PALMER 765.

Hypseleotris dayi **sp. nov.** St. Lucia Lake, S. Africa, SMITH 921 p. 707 fig.

GOBIIDAE

Notes on species from the Faroes and Iceland, TÄNING 970.

Acentrogobius puntang from Cocos-Keeling Islands, MARSHALL 631.

Callogobius hasseltii from Cocos-Keeling Islands, MARSHALL 631.

Favonigobius exquisitus **sp. nov.** Toukley, N.S. Wales, WHITLEY 1054 p. 32 fig.

Gillichthys mirabilis notes on, WEISEL 1033.

Gobioides anguillaria, burrowing habits, CLOWES 205; *G. broussonnetii* recorded from Texas waters, BAUGHMAN 69; From St. Johns river, Florida, KRITZLER 562.

Gobiopterus chuno bionomics, PILLAY & SAROJINI 784.

Gobiosoma novemlineatum **sp. nov.** St. Andrews Island, W. Indies, FOWLER 313 p. 89 figs.

Hannoichthys **nom. nov.** for *Hanno Herre*, preoccupied, HERRE 423.

Paragobiodon echinocephalus from Cocos-Keeling Islands, MARSHALL 631.

Typhlogobius californiensis from S. California, FITCH 289.

BLENNIOIDEA

BLENNIIDAE

Zoogeographical and systematic notes on Eastern Mediterranean forms, STEINITZ 935.

Andamia heteroptera from Christmas Island, Indian Ocean, PALMER 765.

Cirripectus variolosus from Cocos-Keeling Islands, MARSHALL 631.

Istiblennius dussumieri, *I. periophthalmus*, *I. thalassinus*, *I. nitidus*, MARSHALL 631.

Petrosirtes mitratus from Cocos-Keeling Islands, MARSHALL 631.

R u n u l a nomenclatorial notes, SCHULTZ 885.

Salarias tridactylus from Christmas Island, Indian Ocean, PALMER 765.

CLINIDAE

Key to genera, SCHULTZ 885.

Helcogramma synonymy, SCHULTZ 885.

Starksia sancti-andrewsi sp. nov. St. Andrews Island, W. Indies, FOWLER 313 p. 91 figs.

Tripterygion synonymy, SCHULTZ 885.

ZOARCIDAE

Lycodes palearis distributional records, HALSTEAD 392.

RHODICTHYIDAE

Rhodichthys allied to *Paraliparis*, JENSEN 490; *R. regina* from West Greenland, desc. and fig., JENSEN 490.

OPHIDIIOIDEA

BROTULIDAE

Bassogigas key to species, NYBELIN 743.

Brotula barbata recorded from Texas waters, BAUGHMAN 69.

STROMATEOIDEA

NOMEIDAE

Caristioides gen. nov. p. 87 type *C. amplipinnis* sp. nov. Lord Howe Isl., p. 88 fig., WHITLEY 1047.

Centrolophus pompilus recorded from Norway, SCHAANNING 863.

Icticus ischanus from S. California, FITCH 289.

STROMATEIDAE

Identification of specimens by means of otoliths, SANZ ECHEVERRIA 856.

Centrolophus californicus a synonym of *Icichthys lockingtoni*, MYERS 710.

TETRAGONURIDAE

Tetragonurus cuvieri from Gulf of Genoa, GUIGLIA 384.

OPHICEPHALOIDEA

OPHICEPHALIDE

Channa key to Malayan species, TWEEDIE 1001.

Ophiocephalus punctatus from Delagoa Bay, S. Africa, SMITH 921; *O. striatus* breeding habits and early development, MOOKERJEE, GANGULY & BHATTACHARYA 686.

MUGILOIDEA

SPHYRAENIDAE

Sphyraena †malembeensis sp. nov. Miocene Congo p. 225 pl. xvii figs. 29-34; *S. †viannai* sp. nov. Eocene Congo p. 225 pl. xvii figs. 24-28, DARTEVELLE & CASIER 229.

MUGILIDAE

Key to Venezuelan genera and species, SCHULTZ 882.

Mugil (Liza) abu zarudnyi subsp. nov. upper part of Karun river, S. West Iran, BERG 88 p. 852 figs.; *M. brasiliensis* name should cease to be used, TREWAVAS 996; *M. crenilabis* from Christmas Island, Indian Ocean, PALMER 765; *M. crenilabis*, *M. seheli*, *M. waigiensis* from Cocos-Keeling Islands, MARSHALL 631; *M. tade* food and feeding habits, PILLAY 783.

ATHERINIDAE

Key to Venezuelan genera and species, SCHULTZ 882.

Notocheirinae nom. nov. for *Tropidostethinae*, SCHULTZ 884.

Taeniomembradinae, corrected spelling, SCHULTZ 884.

Adenops robbersi sp. nov. Totumo, Colombia, FOWLER 311 p. 5 figs.

Atherinosoma (Taeniomembras) tropicalis sp. nov. Bowen, Queensland, WHITLEY 1047 p. 87.

Coleotropis blackburni sp. nov. Gulf of Venezuela, SCHULTZ 882 p. 108 fig.

Craterocephalus marjoriae Eidsvold, Queensland, p. 85 fig., *C. worrelli* Northern Territory, Australia, p. 86 spp. nov. WHITLEY 1047.

Tropidostethops nom. nov. for *Tropidostethus* Ogilby, preoccupied, SCHULTZ 884.

POLYNEMOIDEA

POLYNEMIDAE

Polydactylus sexfilis from Cocos-Keeling Islands, MARSHALL 631.

Polynemus tetradactylus notes on ovaries and spawning season, KARANDIKAR & PALEKAR 523 & 524.

SCLEROPAREI

SCORPAENOIDEA

Anatomy, phylogeny and taxonomy of Japanese Scorpaenoids, MATSUBARA 639.

SCORPAENIDAE

Keys to subfamilies, genera, subgenera, and species, MATSUBARA 639.

Erosinae subfam. nov., MATSUBARA 639 p. 420.

Neosebastinae subfam. nov., MATSUBARA 639 p. 388.

Sebastolobinae subfam. nov., MATSUBARA 639 p. 326.

Setarchinae subfam. nov., MATSUBARA 639 p. 359.

Apistus evolans structure of finger-like pectoral rays, SATO 860.

Cocotropus masudai sp. nov. Idzu Islands, Japan, MATSUBARA 639 p. 470 fig.

Hatumeus subgen. nov. of *Sebastes* q.v.

Mebarus subgen. nov. of *Sebastes* q.v.

Murasoius subgen. nov. of *Sebastes* q.v.

Neocentropogon gen. nov. type *Paracentropogon aeglefinus* Weber, MATSUBARA 639 p. 430; *N. aeglefinus japonicus* subsp. nov. Kôti, Japan, MATSUBARA 639 p. 432 fig.

Neohispaniscus subgen. nov. of *Sebastes* q.v.

Ocosia fasciata sp. nov. Kumano-Nada, Kii Peninsula, MATSUBARA 639 p. 443 fig.

Parabrachirus gen. nov. type *Pterois heterura* Bleeker, MATSUBARA 639 p. 346.

Pterois antennata, *P. radiata* new records for Riu-Kiu Islands, MATSUBARA 639; *P. radiata* from Christmas Island, Indian Ocean, PALMER 765; *P. volitans*, *P. radiata* from Cocos-Keeling Islands, MARSHALL 631.

Scorpaena bynoensis new record for Riu-Kiu Islands, MATSUBARA 639; *S. hatizyoensis* sp. nov. Hatizyo-zima, Japan, MATSUBARA 639 p. 301 fig.; *S. tristis* from Cocos-Keeling Islands, MARSHALL 631.

Scorpaenodes elongatus sp. nov. Senegal coast, W. Africa, CADENAT 148 p. 665 fig.; *S. keelingensis* sp. nov. Cocos-Keeling Island, MARSHALL 631 p. 199 fig.

Sebastes (*Hatumeus*) subgen. nov. type *Sebastes owstoni* Jordan and Thompson p. 192, MATSUBARA 639; *S. (Mebarus)* subgen. nov. type *Sebastes*

inermis Cuvier and Valenciennes p. 194 MATSUBARA 639; *S. (Muraspius)* subgen. nov. type *Sebastes pachycephalus* Temminck and Schlegel p. 236, MATSUBARA 639; *S. (Neohispaniscus)* subgen. nov. type *Sebastes schlegeli* Hilgendorf p. 226, MATSUBARA 639; *S. (Takenoki)* subgen. nov. type *Sebastes oblongus* Gunther p. 233, MATSUBARA 639; *S. marinus* population study, KOTTHAUS 557; Age and growth of immature specimens, PERLMUTTER & CLARKE 773; *S. (Murasoius)* *pachycephalus* form *nudus* nov. p. 239; *S. (M.) pachycephalus* form *chalcogrammus* nov. p. 244, Japan, MATSUBARA 639; *S. (Mebarus)* *paradoxus* sp. nov. Huzan, Japan, MATSUBARA 639 p. 198 fig.; *S. (Acutomentum)* *paucispinosus* sp. nov. Kesenuma, Japan, MATSUBARA 639 p. 216.

Sebastes maccullochi probably a *Helicolenus*, HUBBS 457.

Takenoki subgen. nov. of *Sebastes* q.v.

TRIGLIDAE

Review of genus, with key to Western Atlantic species, GINSBURG 356.

Key to Swedish species, NYBELIN 744.

Lepidotrigla strauchi structure of pectoral fin rays, SATO 860.

Prionotus martis sp. nov. off Sabine Pass, Texas, GINSBURG 356 p. 502; *P. nudigula* sp. nov. off Rio de la Plata, Argentina, GINSBURG 356 p. 516; *P. paralatus* sp. nov. off Padre Isl., Texas, GINSBURG 356 p. 522; *P. scitulus latifrons* subsp. nov. Rockport, Texas, GINSBURG 356 p. 504; *P. tribulus crasiceps* subsp. nov. off Port Arthur, Texas, GINSBURG 356 p. 517.

Trigla lyra, NYBELIN 744.

CARACANTHIDAE

Caracanthus maculatus from Cocos-Keeling Islands, MARSHALL 631.

SYNANCHIDAE

Inimicus japonicus structure of finger-like pectoral rays, SATO 860.

ANOPILOMATIDAE

Anoplopoma fimbria recorded in large shoals in Monterey Bay, California, COX 216.

PLATYCEPHALIDAE

Neoplatycephalus macrodon, bionomics, FAIRBRIDGE 277.

HOPLICHTHYIDAE

Studies on Japanese species, MATSUBARA & OCHIAI 642.

Hoplichthys filamentosus sp. nov. off Heta, Japan, MATSUBARA & OCHIAI 642 p. 149 fig.

COTTIDAE

Key to genera of Californian waters, BOLIN 111.

Artediellus uncinatus europaeus notes on, NYBELIN 742.

Icelus furciger possibly identical with *I. bicornis*, NYBELIN 742.

Nautichthys oculo-fasciatus from S. California, FITCH 289.

Radulinellus subgen. nov. of *Radulinus* q.v.

Radulinus redefined, with key to species, BOLIN 111; *R. (Radulinellus) vinculus* sp. nov. Santa Rosa Island, California, BOLIN 111 p. 197 fig.

Synchirus gilli recorded from Monterey Bay, BOLIN 111.

Triglops pingelii, *T. murrayi* notes on, NYBELIN 742.

CYCLOPTERIDAE

Eumicrotremus terrae-novae sp. nov. 46° 09' 30" N, 49° 48' 30" W, off Newfoundland, MYERS & BÖHLKE 713 p. 199 fig.

LIPARIDAE

Liparis franzi nom. nov. for *L. liparis* Franz 1910, ABE 5 p. 135.

Paraliparis bathybi from West Greenland, desc. and fig.; *P. copei* from West Greenland, JENSEN 490.

Rhodichthys allied to *Paraliparis*, JENSEN 490.

THORACOSTEI

GASTEROSTEIDAE

Gasterosteus aculeatus two-spined specimen from Essex, BROUGHTON 128; Age and growth, JONES & HYNES 498; Percentage composition of food, HYNES 467.

Pygosteus pungitius age and growth, JONES & HYNES 498; Percentage composition of food, HYNES 467; Food, and occurrence in Western Poland, KAJ 514.

HETEROSOMATA

BOTHIDAE

Definitions of three subfamilies, CHABANAUD 171.

Arnoglossus aspilos praeteritus subsp. nov. W. Australia, WHITLEY 1054 p. 32 fig.

Bothus mancus from Christmas Island, Indian Ocean, PALMER 765.

Citharichthys stampflii from Gaboon Coast, CHABANAUD 169.

PLEURONECTIDAE

Eggs of some genera compared, CHABANAUD 165.

Drepanopsetta platessoides bionomics of Baltic Sea populations, KRÜGER 564.

Glyptocephalus notes on, RASS 816.

Microstomus notes on, RASS 816.

Platichthys stellatus bionomics, distribution and hybridization, ORCUTT 759.

Rhombus maximus bionomics, KÄNDLER 518.

Tanakius notes on, RASS 816.

SOLEIDAE

Lateral line system in relation to asymmetry, CHABANAUD 166.

Key to Venezuelan genera and species, SCHULTZ 882.

Bathysolea profundicola from Mediterranean, CHABANAUD 165.

Capartella polli gen. et sp. nov. S. Atlantic coast of Africa, CHABANAUD 168 p. 16; *C. longisquamis* sp. nov. S. Atlantic coast of Africa, CHABANAUD 168 p. 19.

Liachirus whitleyi sp. nov. East Coast of Queensland, CHABANAUD 170 p. 563.

Microchirus australis p. 6, *M. wittei* p. 7 spp. nov. S. Atlantic coast of Africa, CHABANAUD 168.

Synaptura albomaculata, *S. cadenati*, notes on, CHABANAUD 165.

Vanstraelenia gen. nov. p. 9 type *V. insignis* sp. nov. p. 10 S. Atlantic coast of Africa, CHABANAUD 168.

Xenobuglossus elongatus gen. et sp. nov. S. Atlantic coast of Africa, CHABANAUD 168 p. 13.

CYNOGLOSSIDAE

Principal morphological characters of E. Atlantic forms, CHABANAUD 161.

Cynoglossus key to and notes on species of E. Atlantic, CHABANAUD 161, 163 & 164; *C. cadenati* redescribed, CHABANAUD 162; *C. c. honoris* subsp. nov., Sierra Leone, CHABANAUD 162 p. 206 a synonym of *C. cadenati* p. 520; *C. canariensis*, CHABANAUD 162; *C. cleopatridis* redescribed, CHABANAUD 169; *C. guineensis* redescribed, CHABANAUD 162; *C. lagoensis* redescribed, CHABANAUD 162; *C. monodi* sp. nov., Sierra Leone, CHABANAUD 161 p. 65, a synonym of *C. lagoensis monodi* Chabanaud; *C. senegalensis* a composite species redescribed, CHABANAUD 162; *C. s. browni* morpho nov., Sierra Leone, CHABANAUD 162 p. 204; *C. s. simulator* morpho nov., Dakar, CHABANAUD 162 p. 205 a synonym of *C. s. canariensis* (Steindachner); *C. xiphoideus* abnormal apophysis, CHABANAUD 169.

Symphurus nigrescens notes on, CHABANAUD 167; *S. normani* sp. nov. Cape Lopez, French Congo, CHABANAUD 167 p. 625.

DISCOCEPHALI

ECHENEIDIDAE

Remora photo showing association with *Manta*, HASS 412.

PLECTOGNATHI

†*Eotrigonodon jonesi* descr. & figd. Eocene Congo, DARTEVELLE & CASIER 229.

†*Stephanodus libycus* descr. & figd., Maastrichtian Congo, DARTEVELLE & CASIER 229.

BALISTOIDEA

TRIACANTHODIDAE

Atrophacanthus danae gen. et sp. nov. Celebes sea, FRASER-BRUNNER 322 p. 1 figs.

BALISTIDAE

Balistapus capistratus from Cocos-Keeling Islands, MARSHALL 631.

Balistes caprisus from Welsh Coast, MATHESON 637; From Irish Coast, WENT 1039; *B. flerichei* sp. n. Oligocene Majorca, BAUZÁ RULLÁN 74 p. 519, pl. 27; *B. vetula* "sleeping" behaviour, CLARK 201.

Canthidermis maculatus recorded from Texas waters, BAUGHMAN 69.

Melichthys radula from Christmas Island, Indian Ocean, PALMER 765.

Odonus niger from Cocos-Keeling Islands, MARSHALL 631.

Rhinecanthus rectangulus from Cocos-Keeling Islands, MARSHALL 631.

Sufflamen bursa, *S. chrysoptera* from Cocos-Keeling Islands, MARSHALL 631.

MONACANTHIDAE

Tantalisor pauciradiatus type figd., WHITLEY 1054.

OSTRACIONTIDAE

Lactophrys key to Venezuelan species, SCHULTZ 882.

TRIODONTIDAE

Triodon t̄cabindensis figd., DARTEVELLE & CASIER 229.

TETRAODONTOIDEA

TETRAODONTIDAE

Key to Venezuelan genera, SCHULTZ 882.

Lagocephalus lagocephalus from Pembrokehire, MATHESON 637; From Irish Coast, WENT 1039.

Sphoeroides key to species, SCHULTZ 882; *S. maculatus*, *S. testudineus* recorded from Texas waters, BAUGHMAN 69; *S. vermicularis radiatus*, ABE 3 [see also Vol. 86 1949 Title No. 5].

Tetraodon reticularis from Cocos-Keeling Islands, MARSHALL 631.

DIODONTIDAE

Diodon hystrix from Cocos-Keeling Islands, MARSHALL 631.

MOLIDAE

Mola mola recorded from Texas waters, BAUGHMAN 69; Notes on specimen from Banana, Belgian Congo, DARTEVELLE 227; Notes on body temperature, MORROW & MAURO 696.

Ranzania truncata from Fastnet Rock, Ireland, WENT 1037.

XENOPTERYGII

GOBIESOCIDAE

Key to Venezuelan genera, SCHULTZ 882; Popular account of, WHITLEY 1051.

PEDICULATI LOPHIOIDEA

LOPHIIDAE

Chirolophius anatomy of respiratory apparatus, WILLEM 1058.

Lophius piscatorius recorded from Texas waters, BAUGHMAN 69; Anatomy of respiratory organs, WILLEM 1058.

ANTENNARIOIDEA

ANTENNARIIDAE

Antennarius scaber, photographed feeding ATZ 43; *A. scaber*, *A. pleurophthalmus*, recorded from Texas waters, BAUGHMAN 69.

CHAUNACIDAE

Chaunax respiratory apparatus, WILLEM 1060.

OGCOEPHALIDAE

Dibranchius respiratory apparatus, WILLEM 1059.

CERATIOIDEA

CERATIIDAE

Ceratias holbølli bionomics, systematics and distribution, CLARKE 204; *C. tentaculatus* a synonym of *C. holbølli*, CLARKE 204.

CROSSOPTERYGII

†RHIPIDISTIA

RHIZODONTIDAE

Eusthenopteron dalglesiensis descr. & figd., JARVIK 483.

OSTEOLEPIDAE

Glyptopomus elginensis sp. nov. U.O.R.S. Scotland p. 10, text-figs. 3, 4 pl. ii fig. 2; pl. iii; pl. iv fig. 1; *G. minor*, *kinnairdi* descr. & figd., JARVIK 483.

Gyroptychius groenlandicus sp. nov. M. Devonian E. Greenland, JARVIK 485 p. 11, text-figs 2, 3, 12, 13, 15-24, 28, 29; pls. i-xx; xxi figs. 1-4; xxii; xxiii figs. 2-4; figd. from East Greenland, JARVIK 484.

Megalichthys, structure of bones & teeth, BISTROV 99.

ACTINISTIA

COELACANTHIDAE

†*Rhipis* gen. nov. type *R. moorseli* sp. nov. ? Jurassic Belgian Congo, SAINT-SEINE 850 p. 11 text-fig. 1 pl. i figs. A-C.

†*Undinapiscis* nom. nov. for *Undina* Münster 1842 non Gould 1836, KUHN 567 p. 222.

DIPNEUSTI

Evolutionary trends, WESTOLL 1041 & 1042; Probable origin of hypobranchial arterial system, FOXON 314.

†DIPTERIDAE

Conchodus elkneri sp. n. U. Devonian Poland GORIZDRO-KULCZYCKA 366 p. 69 pl. ii fig. 5; pl. iv fig. 2.

Dipterus, skull, PARRINGTON 766; *D.* sp. from U. Devonian Poland figd. GORIZDRO-KULCZYCKA 366.

†HOLODONTIDAE fam. nov.

Holodus santacrucensis sp. n. U. Devonian Poland, GORIZDRO-KULCZYCKA 366 p. 56 text-figs. 1-2 pls. i, ii figs. 1-2, iii, iv fig. 1.

LEPIDOSIRENIDAE

Protopterus polli sp. nov. Miocene Congo, DARTEVELLE & CASIER 229 p. 206 text-fig. 62B pl. xxii figs. 4, 5.

CERATODONTIDAE

†*Ceratodus madagascariensis* descr. & figd., DECHASEAUX 234.

